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The INDUSTRIAL ARTS MAGAZINE

NOVEMBER, 1921
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MILWAUKEE, WISCONSIN

VOCATIONAL SCHOOL SURVEY

IS YOUR SCHOOL TEACHING SHEET METAL WORKING OR DOES IT CONTEMPLATE PRACTICING THIS COURSE?

Sheet Metal class connecting forges, State Normal School, Oswego, N. Y.

THE sheet metal industry wants to know how many Vocational Schools there are in the United States teaching Sheet Metal Working.

For compositions on the value and interest of sheet metal work for eighth and ninth grades or for high and normal schools we will forward free gratis a copy of the SHEET METAL PRIMER.

For the best fifty compositions from students, instructors or school supervisors of schools where sheet metal working is being taught we will give away free fifty copies of ESSENTIALS OF SHEET METAL WORK AND PATTERN DRAFTING regularly sold at one dollar and fifty cents a copy.

Class-room photographs and of work accomplished will be appreciated and these in their order will have reproduction in this journal and sheet metal trade papers in the early future.

The list of Vocational Schools in the United States teaching sheet metal working is growing daily and because there are many schools which have been equipped through distributors, it is the object of this survey to receive a more complete list of schools already successfully teaching this course.

THE PECK STOW & WILCOX CO.

MAKERS OF MECHANICS' HAND TOOLS
SHEET METAL WORKING MACHINES AND TOOLS

SOUTHINGTON CONN.

INDUSTRIAL-ARTS MAGAZINE

Volume X NOVEMBER, 1921 Number 11

Industrial-Arts and Prevocational Education in Our Intermediate and Junior-High Schools

II. ORGANIZING AND CONDUCTING REPRESENTATIVE ACTIVITIES

A. H. Edgerton, Indiana University

MANY promising results and a few striking inadequacies have been pointed out in connection with recent investigations of the seventh, eighth, and ninth grade industrial activities in 379 of the most progressive intermediate and junior high schools in the United States. In studying these data, one is impressed by the marked improvements in content and method which have been realized during the past five years. Undoubetdly this progress is due partially to our greater tendency to insist upon having courses of study in industrial education programs based upon clear-cut needs and objectives. In judging the worth of *what* and *how* we teach in the shop and other related courses, both administrators and teachers have found it advantageous to distinguish more clearly between the aims and purposes of those courses which have more or less indirect vocational significance, but are offered mainly for general educational ends, and those units which point directly to a means of preparation for wage-earning occupations. However, there still is a wide difference of opinion with respect to the most suitable methods for organizing and offering the former courses, especially with the thought of having seventh, eighth and ninth year boys learn most effectively and economically.

In some respects, the various claims for the industrial arts courses might be considered as hopeful expressions of ideals rather than as representing the present status and conduct of this work. This is one more indication of the progressive spirit which is backing the movement in this country for democratic ideals in our public school systems. Notwithstanding the similarity noted in the chief claims, which after all differ largely as to the amount of emphasis given to each item, the achievements observed in a number of schools make it evident that a decided difference exists both in the conception of the claims themselves and also as to how these can be realized most satisfactorily.

Reasons for Offering Courses.

In the reports from 303 schools, each of which gave its main reason for offering instruction in the industrial arts and related studies, the four leading claims, when collated, were found to be given the following order of importance:[6]

1. Contributing to the general experience, all-around development, and industrial intelligence.
2. Aiding in the intelligent selection of industrial occupations without encouraging early choices.
3. Enriching the school experience of the pupil through concrete situations.
4. Preparing for entrance into industrial vocations in the school and through cooperation outside.

It is obvious that these claims give little clue to the actual content and method of the courses which they represent.

Determining the Important Need for Courses.

Although over 80 per cent of the 379 schools investigated state that their industrial activities aim (1) *to develop the pupil's special aptitudes and capacities* and (2) *to prepare him for the demands which the future is going to make upon him,* there is a decided range of opinion as to how these objectives are to be accomplished. Many of the school authorities seriously believe that the success of the industrial arts instruction depends upon the extent to which the work is organized and offered in approximation of the processes, problems, and conditions in the divisions of industry represented.

It is encouraging to observe that *over 67 per cent of these intermediate and junior high schools are attempting to broaden and vitalize the industrial activities which heretofore have consisted mainly of shop work* (often limited to benchwork in wood.) The junior high schools of Los Angeles, California, offer a good illustration of this change which has taken place in many systems during the past two or three years. In this case, the shop courses, which formerly covered three years of woodwork, have been reorganized to give

[6] See Table II in the introductory article for number and per cent of schools which emphasized each item.

pupils so-called vocational exposure along with the study of occupations for the purpose of enabling them to enter their lifework with some vision of the vocations. Experience already has shown that the industrial arts or prevocational courses are an incentive for causing pupils to enter the senior high school, in which case they are prepared to elect vocational or other courses more intelligently and to make progress from the outset.

Industrial Work a Functional Activity.

Because it is impossible to represent all of the various recognized wage-earning occupations in the local community, a small number of the schools have concluded for the present, at least, to consider the industrial work more as an intellectual or liberal study than as a functional activity. The shopwork observed in several of these schools resembles the earlier form of manual training which was introduced at that time as a mental discipline rather than as a practical subject. As a result, such courses are so formal and isolated that they apparently fail to connect up with the practical applications of everyday life. Even the technique, which is emphasized in making different abstract pieces and exercises, does little to inculcate habits of productive industry, thrift, and service as occasionally is claimed.

It unquestionably would be both impracticable and undesirable for any school to fully represent so great a variety and number of highly specialized occupational pursuits as are listed for any of our cities of mixed industries in the last Special Report of the United States Census. The expenditure could be justified neither on the basis of vocational efficiency nor because of educational needs. An investigation which was conducted a few years ago by Dr. L. P. Ayres, of the Russell Sage Foundation, in order to ascertain the facts concerning the conditions in 78 American city school systems, has some bearing on this claim that the intermediate or junior high school should participate in a program for industrial education "that will directly prepare the children to enter the local industries." The facts regarding the birthplace of the 13-year old boys in the public schools of those cities, which were between 25,000 and 200,000 population, show that "only one father in six was born in the city where he now lives and only a few more than one-half of the boys were born where they now live."[7] Table III shows the detailed facts of the 22,027 cases studied by Dr. Ayres.

On the other hand experience of the past few years has demonstrated clearly that it is possible to offer well-organized units of typical activities, which will develop varying degrees of industrial intelligence and give insight into the condition in a number of modern industries without the danger of over-emphasizing the limitations in localized and undesirable occupations. This does not mean that we should be unmindful of the *local needs and interests* in representing and organizing industrial-arts courses for any community. The local well-being of the home and community in an agricultural section, for example, demands a somewhat different emphasis in its industrial work than would be offered to meet the needs in a city of mixed industries.

Table III. Facts Concerning Birthplace of 22,027 Boys and Their Fathers Indicate that Large Majority of Adults Will Not Work in Same Communities Where Schooling is Received.

	——Boys——		——Girls——	
Birthplace	Number	Per Cent	Number	Per Cent
Same City	12,699	58	3,601	16
Same state but not same city	4,233	19	5,349	24
Other states in United States	3,069	14	4,364	20
Foreign country	2,026	9	8,713	40
Total	22,027	100	22,027	100

Wide Range in Content of Industrial Courses.

Rural industrial work, which mainly concerns itself with farm projects that are carried on inside and outside of the school shop, represents one type of local interest for helping to determine the content and method in several of the schools reporting. With few exceptions, the essentially rural communities state that notable progress has been made by abandoning the absurd practice of basing their procedure largely upon the courses and methods of the larger school systems. For obvious reasons, the all-around or farm-workshop plan, already described as a solution for the industrial arts in the smaller community, likewise is found most suitable for the limitations of these rural intermediate and junior high schools.[8]

Such closely related activities as carpentry, concrete construction, harness repair, forging, bench metal work, gas engine operation, machine assembly and repair, farm woodwork, and the like are taught by the local instructor, who frequently extends the opportunity for concrete experiences and information by cooperating with practical men and establishments in the community. It is evident that the needs in any one of these activities call for a diversity of dexterity and knowledge for understanding, for constructing, improvising and repairing products to be used on the farm and in the home. The needs in farm woodwork, for instance, are not so much for products involving carefully made, close fitting joints as they are for such comparatively rough but useful constructions as potato crates, gates, brooders, hen-coops, cold frames, seed testers, corn-cribs, garages, eveners, single-trees and various rebuilding and repair jobs. The schools which stress the home needs as a part of the farm-mechanics courses often include the renewal and repair of such utilities as faucets, window and door screens, plumbing, electrical fixtures and appliances, the adjustment of window shades, door locks, lawn mowers, doors that bind; also, the making of the many other adaptations which must

[7] Ayres, L. P. "Some Conditions Affecting Problems of Industrial Education in 78 American School Systems." Russell Sage Foundation Publication.

[8] Roehl, L. M. "A Farm Workshop." INDUSTRIAL-ARTS MAGAZINE, Nov., 1915, Vol. IV.

necessarily be met in rural communities. When properly offered in terms of the school and home projects, the industrial activities and related studies furnish excellent possibilities for unifying the school, the farm and the homelife of all concerned.

Industrial-arts courses in cities of mixed industries are being organized more and more to include different types of representative experiences chosen from present-day industrial callings. Beginning in the seventh grade, boys in many cities of over 10,000 population are given short courses in a number of shop units as a tryout, or so-called prevocational, period. This system frequently gives both the pupils and teachers some basis for the future selection of courses and occupations. Some of the schools insist that they are extending these opportunities in order to give special preparation for entrance into the skilled trades. For example the Hackley Manual Training School, at Muskegon, Mich., allows its pupils to elect vocational or trade school courses at the end of the seventh year, if circumstances make it impossible or undesirable for boys to continue through the regular high school. Perhaps the industrial courses in the Lafayette Bloom Junior High School, at Cincinnati, O., give one of the best illustrations of a department which primarily aims to offer an earlier beginning in specific training for those boys who leave school without much further preparation. These courses are the exception, however, as a large majority of the schools report that they are making no special attempt to emphasize proficiency in specific occupations as low as the seventh and eighth grades, because of their conviction that the industries offer little to boys under 16 years of age. Nevertheless, a comparatively large number of schools in this group insist that boys can be given enough freedom in choice and sufficient variety of industrial experiences to help many in the selection of their lifework and some in the beginning of their preparation for it.

The most progressive of these industrial-arts courses which are designed, in part, to try out interests in order to determine likes and dislikes, and to test capacities for understanding and doing industrial and mechanical work, do tend to contribute more toward the vocational efficiency of the pupils during the ninth grade. This would seem to be the psychological and physiological time to place somewhat greater emphasis upon technique and the related technical information. As a result of the various try-out experiences in the seventh and eighth years, some pupils are found taking more intensive work in courses already started while others investigate new activities or experiment with selected problems. This practice is also increasing in those schools which take the attitude that while a number of the boys will not be adapted to industrial work, either in interest or ability, all boys should have an intelligent understanding of productive industry as to processes, conditions, and relationships.

General Methods in Organizing Try-Out Courses.

In the best of these courses, each pupil participates in a reasonable amount of work which stresses the atmosphere and, to some extent, the time element and accuracy of the commercial plant.[9] Whenever the equipment in the school shop, for example, will not allow boys to do their work by the most practical methods, it is made clear how this would be taken up in the commercial shop and that their work is being carried on in as practicable a manner as possible with the necessarily limited shop facilities. This and other information relative to the methods used in larger productive industries is gained through such sources as planned excursions, reliable reading matter, student reports, motion pictures, class discussions and talks by specialists.

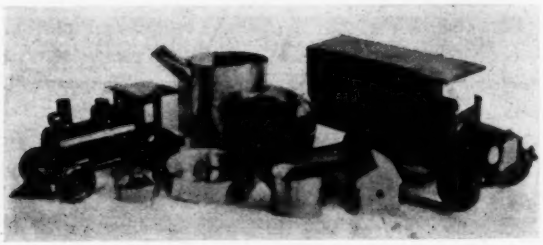
As would be expected, there is some variation both in the kinds and in the organization of shop activities represented in the various school systems. The Ettinger plan, in New York City, for example, provides for the rotation of a combination of nine-week units in designated intermediate schools, where the boys get experience in machine work, sheet metal, printing, wood working, electric wiring, plumbing, drafting, garment design, sign painting and bookbinding. This plan is so organized that a boy who has unusual ability may receive special training without completing the cycle.

The junior high school, at Grand Rapids, Mich., also rotates the boys in printing, sheet metal work, automobile construction, wood working, machine shop practice, electrical construction, forging and mechanical drawings for one double period daily. This school undertakes to have each boy sample the eight activities for ten-week periods during the seventh and eighth years, in order that he may continue one elected activity more intensively for the entire year.

At School No. 47, Buffalo, N. Y., the industrial activities include machine shop practice, forging, sheet metal work, pipe fitting (for the seventh grade), bench woodwork, plaster casts, wood turning, pattern making and molding, electrical work (for the eighth grade), carpentry, cabinet making, wood finishing, pattern making and foundry work, concrete construction (for the ninth grade), and mechanical drawing (for all grades). The boys in this school spend three hours or one-half of the school day in these try-out courses.

There is an attempt to separate the try-out and technical activities from the socalled vocational work in the Washington Junior High School, at Rochester, N. Y. As will be explained in more detail later, the printing, millwork, pattern making, sheet metal work, painting and decorating, and mechanical drawing facilities are used in common for both types of courses during separate periods, while the cabinet making, machine, electrical and automobile shops are reserved especially for either purpose.

[9] Edgerton, A. H. "To What Extent Can We Justify the Use of Machinery in Our School Shops on the Basis of Its Efficiency?" INDUSTRIAL-ARTS MAGAZINE, Nov., 1915, Vol. IV, p. 202.



A FEW OF THE SHEET METAL PROBLEMS WHICH WERE SELECTED AND DEVELOPED DURING THE LATTER PART OF THE COURSE.

The Thirtieth Street Junior High School, at Los Angeles, California, which has already been referred to in this article, is organizing its activities "so that there will be little woodwork in the seventh and eighth grades." This school has organized its widely varied try-out courses in the seventh year "to consist of ten weeks of agriculture, ten weeks of mechanical drawing, ten weeks of typewriting and ten weeks of printing. These courses are to be followed in the eighth year by ten weeks of sheet metal, ten weeks of electrical work, ten weeks of concrete work, and ten weeks of plumbing. It is the intention to have the ninth year courses so organized that the work of the previous grades may be worked out into vocational classes for the higher grades." Regarding the content of these industrial-arts activities, Assistant Supt. Helen S. Watson reports as follows: "In all of this work, the emphasis is placed upon the practical side. In the Boyle Heights Junior High School, for example, all repairs of school furniture, locks, making of keys, construction of shelving, cupboards and tables are done by the regular classes. Concrete workers have built retaining walls and repaired walks, and are now constructing a pit in the machine room for the installation of motor and shafting. A lath house, including the installation of plumbing and the building of a fence, is now being made for the agricultural department. It is understood that at least one-half of the time of the older boys may be spent on work for the school.

How Industrial-Arts Activities Are Conducted.

The amount of emphasis which is given to each element in these and other try-out courses shows even greater variation than has been noted in the activities themselves. However, a great majority of the least hampered intermediate and junior high schools ---231 or 61 per cent of those which reported--- have organized their industrial arts courses so that *each concrete experience brings boys in contact with information on some phase of the conditions and processes encountered in present-day industry and occupations, as well as with the materials, tools and methods of manipulation in the activities represented at the school.* Regardless of the nature of the project, problem, or job-- whether it happened to be a division of concrete construction, carpentry, electrical work, printing, machine shop, drafting, or any other industrial pursuit--each boy in these courses gives little or much time (approximately from five to 35 per cent of the total time allowed) to such types of closely-related information as the kinds and properties of material used; the particular form of design and construction needed; the methods of manufacture practiced outside; and the principles and facts affecting the conditions and relationships under which workers work. Nearly all of the manual experiences which naturally are made the basis of opportunity for giving this *information to extend the boy's industrial horizon,* result in useful and semi-commercial products and service.

Basis of Semi-Commercial Work.

The greater part of this semi-commercial work (estimated as high as 95 per cent in some schools) is based upon the construction and repairs needed in the school systems. Only a few of the schools feel free to state that the requirements of repair or productive work in their systems are considered second in importance to the pupils' needs beyond these immediate experiences. Furthermore, over two-thirds of the instructors in the 231 institutions mentioned above, admit that they can not justify the time and effort required for a large proportion of this construction and repair work, especially when they are ordered to deliver the products within a limited time. The reasons which were given most frequently by 157 individuals for their dissatisfaction with the over-emphasis and unregulated demands of the school system upon repair and maintenance construction

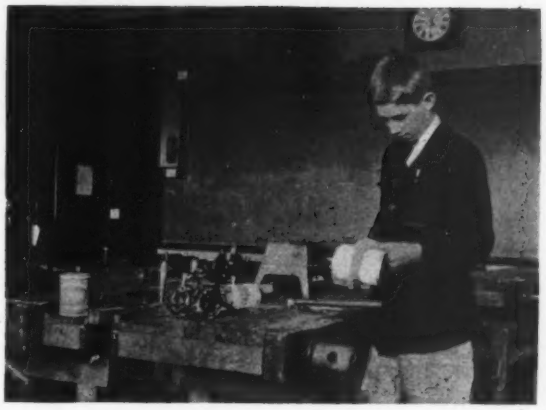
Table IV. Each of 157 Individuals Gives Reasons for Dissatisfaction With Continuous Demands Upon Industrial-Arts Activities for Repair and Productive Work.[1]

ITEM—	NO.
Unregulated requirements limit the amount of instruction given.	
1. Technical information for enlarging the understanding of tools, materials, operations, and principles directly related to the shopwork	37
2. Vocational information for illuminating the school experiences by giving insight into commercial processes and methods employed in economic production	28
3. Occupational information for helping to appreciate and judge labor conditions, importance of work, health problems, future opportunities, qualifications and training	21
Narrow limitations in maintenance needs of schools tend to:	
1. Prevent representation of proper forms of industrial experiences to meet various needs of pupils	32
2. Require instructors to do much of the planning and construction work for pupils	17
3. Cause difficult operations to frequently precede the simpler ones	8
Extended repetition of same operations and processes seem to:	
1. Give too highly specialized skill for boys of this age	14
2. Cause adolescent boys to lose interest in work with little variation	11
3. Limit scope of acquaintance with typical tools, machines, materials, and processes of manipulation	7

[1]These numbers will total more than 157, as several individuals reported more than one reason.

work, are summarized in Table IV. It should be noted that the main objections are to the effect of limiting the industrial experiences to the manual aspects of the work; namely, preventing the instruction from including a larger understanding of the processes and conditions in the industries represented, by failure to regulate these valuable experiences in order that the puipls' needs and interests might receive first consideration.

Nevertheless, increasing numbers of schools are adding other concrete experiences besides those which tend to furnish the largest financial return by materially reducing the annual budget for repairs and production work. These new industrial-arts activities seem to be allowing a larger percentage of time for the study of those methods, conditions and relationships that are involved in the divisions of industry which the school experiences represent. Although boys of this age are interested primarily in the various phases of the direct manual experience, more and more instructors have come to recognize the need for vitalizing the manipulative aspects of the activities by introducing thought-provoking situations. Both projects and problems in these courses include a *breadth of instruction* which



EIGHTH GRADE BOY AT HASTINGS, NEW YORK, MAKING BATHROOM FIXTURES FOR A DOLL-HOUSE PROJECT IN THE SHEET METAL CLASS.

stimulates thought for better understanding, insight and appreciation. A few representative types of the directly and indirectly related information, which boys acquire profitably as they plan and construct products having real use value, are listed in the first section of Table IV.

(To be continued.)

PROBLEMS FOR HALLOWE'EN

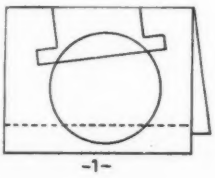
Miss S. E. E. Hammond, Assistant Supervisor of Art, Springfield, Mass.

No. 1.

Material:

1 pc. manila paper 6″ x 9″.
One 3″ circle of medium weight paper.

Fold paper 6″ x 9″ on short diameter. Fold 6″ edge to form strip about 1″ x 6″. Trace circle allowing circle to extend over fold. Illustration 1. Draw short line across top of circle. Finish outline for hat. Illustration 2. Color face orange, features, hat, and lower strip black. Cut on lines and fold. See picture. Repeat color on opposite side.



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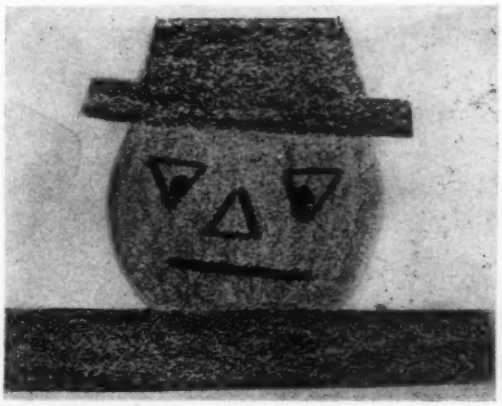


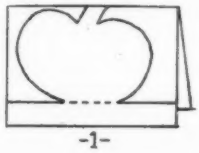
PROBLEM 1.

No. 2.

Material:

1 pc. manila paper 4½″ x 6″.

Fold paper 4½″ x 6″ on short diameter. Fold 4½″ to form oblong about ½″ x 4½″. Unfold. Cut as



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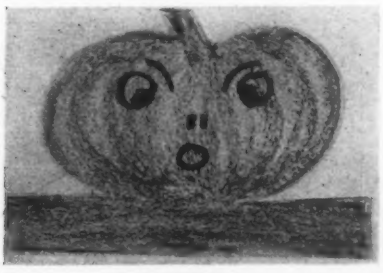


PROBLEM 2.

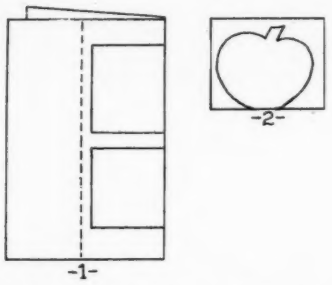
shown in Illus. 3. Color pumpkins using yellow and orange crayon. Color stem green, oblong ½″ x 4½″ brown or black. Use black for features. Repeat colors on opposite side.

No. 3.

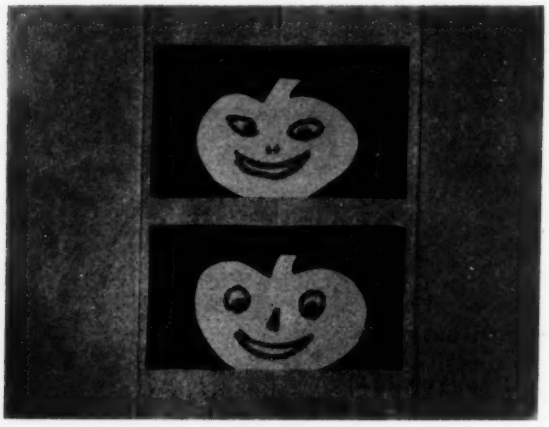
Material:

1 pc. brown paper 6″ x 8″.
1 pc. black paper 4″ x 6″.
2 pcs. orange paper 2½″ x 3″.

Fold brown paper 6″ x 8″ on short diameter. Unfold, fold 6″ edge to fold. Repeat with opposite 6″



edge. Unfold. Refold on first fold. Paper is now 4″ x 6″. Cut as shown in Illus. 4, having top margin about ½″ and lower margin about ¾″. Unfold. Refold oblong 2″ x 6″. Paste black paper 4″ x 6″ on back of cut out paper. From orange papers 2½″ x 3″ cut two pumpkins. Illus. 5. Draw features with black crayon. Paste in position. See picture.



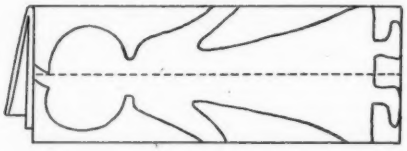
PROBLEM 3.

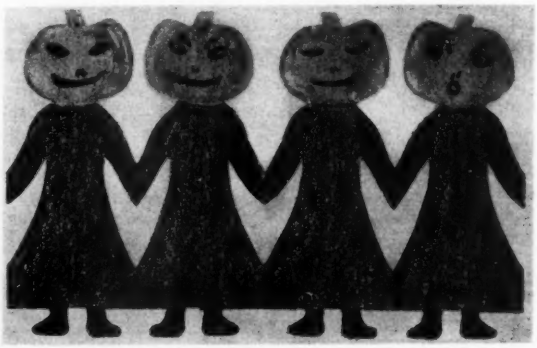
No. 4.

Material:

1 pc. manila paper 6″ x 9″.

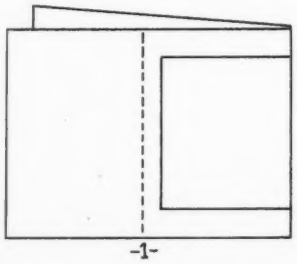
Fold manila paper 6″ x 9″ on short diameter. Keep folded, fold again. Paper is now 2¼″ x 6″. Fold one 6″ edge back to 6″ fold. Unfold last fold. Using last fold as guide cut four connected pumpkin dolls. Illus.





PROBLEM 4.

6. Color pumpkins orange, stems green, features black, dresses and feet black or any desired color. Repeat colors on opposite side.



PROBLEM 5. OPENED.

No. 5.

Material:

1 pc. brown paper 4½″ x 12″.
1 pc. orange paper 4½″ x 6″.
1 pc. black paper 2″ x 6″.
1 pc. black paper 2″ x 2½″.

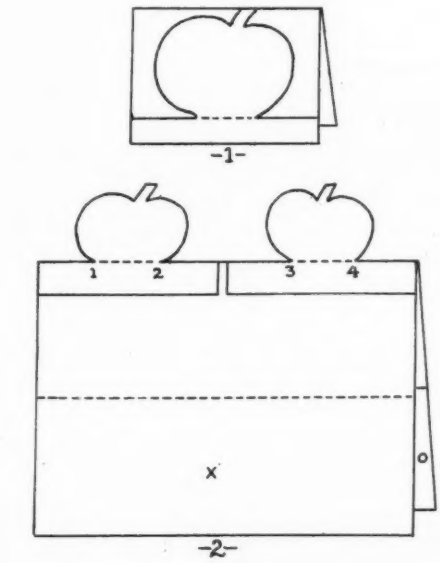
Fold brown paper 4½″ x 12″ as in No. 3. Cut as shown in Illus. 7. Cut one 6″ edge of black paper 2″ x 6″ to represent trees, steeples, and house tops. Paste on back of brown paper at lower edge of opening. Paste orange paper on back of brown paper. Cut old witch on broom and moon from black paper 2″ x 2½″. Arrange and past on orange paper. See picture.

No. 6.

Material:

1 pc. black paper 6″ x 9″.
2 pcs. manila paper 3″ x 4½″.

Fold black paper 6″ x 9″ on short diameter. Unfold, fold 6″ edge to fold. Repeat with opposite 6″ edge. Fold one manila paper 3″ x 4½″ on short diameter. Fold 3″ edge to form oblong about ½″ x 3″. Cut pumpkin. Illus. 8. Repeat with second manila paper 3″ x 4½″. Color both sides of pumpkins orange, stems green, features black. Fold black paper on first fold. Paper is now 4½″ x 6″. Place pumpkin heads on black paper. Illus. 9. Place four points 1-2-3-4 on black paper on fold. With pin points cut fold between 1 and 2, and 3 and 4. Fold back one end of double strip of manila paper ½″ x 3″, slip strip in slit putting long end in first, unfold folded end. Repeat with other pumpkin head. Paste strips at ends to black paper each side of fold. Fold oblong x on oblong o, paste each end to hold in place.



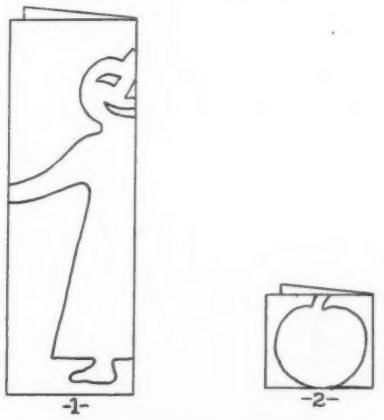
PROBLEM 6.

No. 7.

Material:

2 pcs. black paper 6″ x 9″.
1 pc. thin orange paper 2½″ x 3″.
1 pc. thin orange paper 1″ x 2½″.

Fold one piece black paper 6″ x 9″ on long diameter. Cut Pumpkin Lady. Features should be good size. Illus. 10. Fold second black paper 6″ x 9″ on long diameter. Place first black paper on second black paper, trace, and cut. Cut thin orange paper 2½″ x 3″ size of pumpkin head, apply paste to edge, paste, paste on



PROBLEM 7.

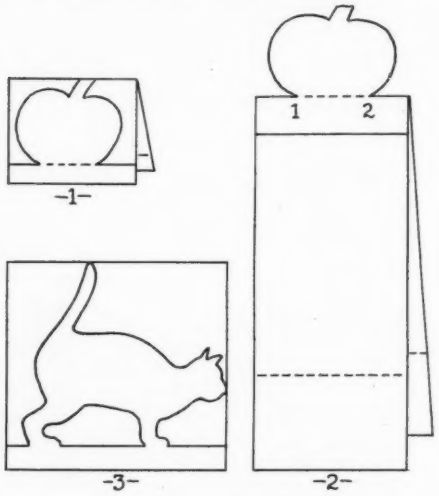
black paper. Paste second black pumpkin head to opposite side of orange paper. Care should be taken to see all edges of one black paper match edges of other black paper. Fold thin orange paper 1″ x 2½″ on short diameter. Cut two pumpkins from this folded paper. Illus. 11. Place a little paste inside each of the four hands, slip pumpkin between each two hands, press together firmly.

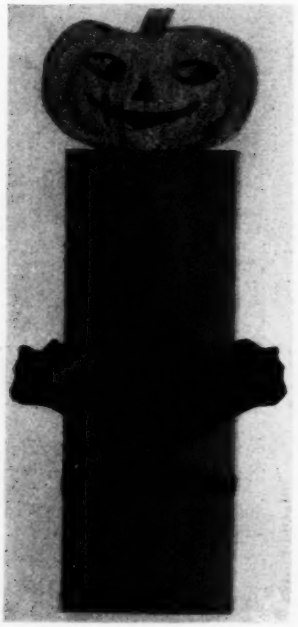
No. 8.

Material:

1 pc. blue paper 4½″ x 12″.
1 pc. manila paper 3″ x 4½″.
2 pcs. black paper 3½″ x 8½″.

On blue paper 4½″ x 12″ draw 12″ line 1″ from and parallel to one 12″ edge. Repeat on opposite 12″ edge. Fold on 12″ lines. Paper is now 2¼″ x 12″. Draw 2¼″ line 1½″ from and parallel to one 2¼″ edge. Repeat on opposite 2¼″ edge. Fold paper on short diameter with 2¼″ lines on outside. Fold on each 2¼″ line. Fold manila paper 3″ x 4½″ on short diameter. Fold 3″ edge to form oblong about ½″ x 3″. Unfold last fold. Cut pumpkin. Illus. 12. Using colored crayons color pumpkin yellow and orange, stem green, draw features with black. Repeat coloring for opposite pumpkin. Fold blue paper so it is 2¼″ x 6″. Illus. 13. Place pumpkin head on blue paper. Illus. 14. Place two points 1 and 2 on fold of blue paper. Unfold blue paper. With pin point cut fold between points 1 and 2. Fold back one end of double oblong ½″ x 3″ on pumpkin head, slip oblong in slit of blue paper long end first, unfold folded end, separate oblongs, refold blue oblongs 1″ x 12″. Fold on short diameter so blue paper is again 2¼″ x 3″. Illus. 15. From black paper 3½″ x 3½″ cut cat. Illus. 16. On other black paper trace cat and cut out. Paste cats in position. See picture. Cut off extending strips. Slip oblong 1½″ x 2¼″ into opposite oblong 1½″ x 2¼″.



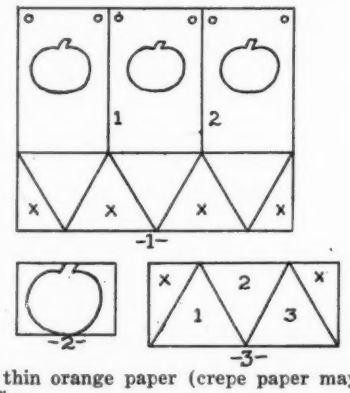


PROBLEM 8.

No. 9.

Material:

1 pc. dark blue paper 7″ x 9″.
1 pc. gray paper 2½″ x 6″.
3 pcs. thin orange paper (crepe paper may be used) 2½″ x 3″.



3 pcs. thin orange paper (crepe paper may be used) 2½″ x 3½″.
1 pc. manila paper 2″ x 2½″.
1 pc. dark blue raffia 12″.
1 pc. orange raffia 12″.

On dark blue paper 7″ x 9″ draw 9″ line 2½″ from and parallel to one 9″ edge. Mark off 9″ line in 3″ measures. On opposite edge of oblong 2½″ x 9″ place dots at 1½″, 4½″ and 7½″ respectively. Illus. 17. Connect points as shown. Cut out parts marked x. Mark off 9″ edge in 3″ measures. Draw lines 1 and 2. Fold on these lines. From manila paper 2″ x 2½″ cut pumpkins. Illus. 2. Using this as pattern trace pumpkin on each of three oblongs 3″ x 5″. Illus. 18. Cut out pumpkins. Place thin orange paper 2½″ x 3½″ back of pumpkin opening, draw features with black crayon. Repeat with other two orange pieces 2½″ x 3½″. Paste orange paper 2½″ x 3″ at four corners back of pumpkin shaped opening. Repeat with other two orange papers 2½″ x 3″ back of other two pumpkin shaped openings. Paste orange papers 2½″ x 3″ over orange papers already pasted, placing features next

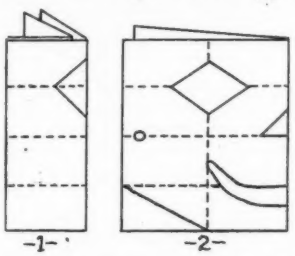
to pasted orange paper. Punch six holes. Illus. 19. Twist blue and orange raffia, thread through holes, fold ends back, paste down on inside. On gray paper 2½″ x 6″ place dot at middle point of one 6″ edge. On opposite 6″ edge place dot 1½″ from end of edge. Repeat at opposite end. Two dots are 3″ apart. Illus. 20. Draw lines as shown. Cut out parts marked x. Paste triangles of base of transparency on triangles 1, 2, and 3.

No. 10.

Material:

1 pc. black paper 6″ x 9″.
2 pcs. cord 14″.

Fold black paper 6″ x 9″ on long diameter, unfold, fold 9″ edge to fold. Repeat with opposite 9″ edge.



Unfold paper. Fold paper on short diameter, keep folded, fold again. Paper is now 2¼″ x 6″. Cut eye. Illus. 21. Unfold last fold. Paper is now 4½″ x 6″. Cut nose, mouth, and side of chin. Illus. 22. Punch holes, tie cords in holes.

No. 11.

Material:

1 pc. gray paper 9″ x 12″.
2 pcs. cord 14″.

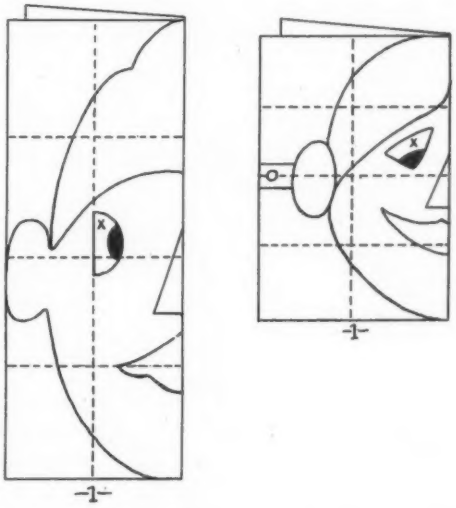
Fold gray paper 9″ x 12″ on short diameter, unfold, fold 9″ edge to fold. Repeat with opposite 9″ edge. Unfold paper. Fold paper on long diameter, unfold, fold 12″ edge to fold, repeat with opposite 12″ edge. Unfold paper. Refold on long diameter. Paper is now 4½″ x 12″. With black crayon draw one-half of mast. Illus. 23. Cut out just outside line. Cut out part of eye marked x. Outline other half of mask. The cap may be colored any color desired. Tie cords around each ear.

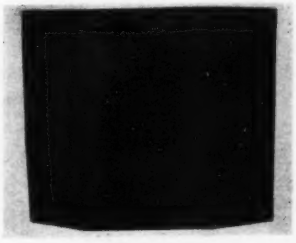
No. 12.

Material:

1 pc. gray paper 9″ x 12″.
2 pcs. cord 14″.

Fold gray paper 9″ x 12″ in sixteen oblongs as in No. 24. Unfold paper. Fold paper on short diameter. Paper is now 6″ x 9″. With black crayon draw half of mask. Illus. 25. Cut out just outside line. Cut out part of eye marked x. Outline other half of mask. Color hair including puffs over ear black. Tie cords in holes.





PROBLEM 9.

BELOW: PROBLEM 10. ABOVE: PROBLEM 11. RIGHT: PROBLEM 12.

FOREMANSHIP TRAINING

Beverly B. Burling, Industrial Training of Men and Boys, Milwaukee Board of Education, Extension Department, University of Wisconsin

INDUSTRIALLY it is well understood that the foreman, standing as he does on the middle ground between management and labor, largely determines the feeling of the worker on questions of a firm policy. It has been rightly said that "he is the pulse of the factory" but upon him also rests the quality and quantity of the product manufactured. The most logical means of strengthening the industrial organization and indirectly raising the standard of the product is through the foreman, realizing that an efficient system can only be maintained when there is:

1. A willing cooperation,
2. A respect between employee and manager,
3. A sense of mutual responsibility and opportunity,
4. A mutual loyalty.

In classes for foremen it is significant that the majority of members realize the importance of a careful study of the "Human Element in Industry" and so have expressed themselves in numerous questionnaires. Such courses naturally should contain, and probably be constructed around, the topics which the men feel are most necessary for greater success in their work. The spirit of cooperation should permeate such a class. Its object is to help the foreman and its success necessitates a lively interest on the part of the attendants.

The duties of a foreman may be classified under supervisional, productional and instructional. In the large factory organizations, it has been found necessary to subdivide the work for the "old foreman." Supervision has been delegated to one, production to another, and instruction to still another individual. Without doubt the time is not far distant when the number of foremen and prospective foremen, who desire to avail themselves of development courses, will be such that a more detailed subdivision of instructional material can be made along the specific lines determined by the duties of the "new foreman." It can not be expected that a course of reasonable length would cover all the phases of supervision, production and instruction any more than a course designed for one factory organization would exactly fulfill the requirements of another. For this reason the preliminary series of discussions should be designed to deal with fundamentals and lay the foundation for future courses dealing more specifically with the different classes of foremen in our shops.

Questionnaires which were received prior to the inauguration of a course in one of our nation's largest corporations indicated that the men desired a study of problems dealing with:

1. The human element in industry.
2. Production, efficiency methods, and time and m tion study.
3. The foreman's job, classification of duties, etc.
4. Maintenance of equipment.
5. Handling of stock.

Numerous other topics were suggested which are largely inclusive in the above. The expansion of these topics formed the basis of probably the strongest foremanship courses offered to date, a brief outline of which follows:

The Human Side of Industry.

1. The laborer in industry.
2. The evolution of the laborer in industry.
3. The influence of the factory organization upon the laborer.

(Place the worker, superintendent, foreman, manager, etc., in the system.)

4. Elements which retard production (if not properly considered).

Emmigration, unions, socialism, prejudice of labor against capital, etc.

5. Conditions which retard production:

(a) Factory (long hours, low wages, insanitary conditions, illumination).

(b) Home (poverty, poor housing, poor food, etc.).

(c) Leisure (bad amusements, intemperance, social evil, etc.).

6. Conditions which increase production:

(a) Factory (fair hours, good wages, good factory conditions).

(b) Home (good housing, refinement, food, thrift, etc.).

(c) Leisure (education, wholesome amusement, etc.).

7. Cooperative agencies.
8. Scientific management.

Using efficiency systems to aid worker not employer.

9. Handling men.

Hiring and firing, foreign labor, colored labor, etc.

10. True elements of leadership.

How to select and develop leaders.

Production: Efficiency Methods.

1. Detailed study of existing conditions. (Each student is required to make a detailed study of his own factory condition including as far as possible the items suggested and make a report of same.)

(a) General conditions of shop-sanitation, care of equipment, scrap pile, waste of time, attitude of labor, etc.

(b) Time keeping method.

(c) Inspection methods.

(d) Wage system.

2—Factors which increase production.

(a) Good lighting, ventilation, heat, sanitary conditions, good drinking water and fan system.

(b) Good wages and a system which will inspire greater effort.

1. Correct time keeping systems.

(c) Separation of male and female employees.

(d) Elimination of waste time at machines.

1. Placement of machinery in proper sequence.
2. Time each machine is idle, causes.

(a) Workman away for legitimate reasons.

(b) Break down.
(c) Failure to get material.
(d) Adjusting for next job.

(e) Elimination of workman's loss of time.
(a) Tool room location.
(b) Drinking fountain, etc., handy.
(c) False motions.
(d) Sharpening tools, etc.
(e) Failure to get material.
(f) Machine, belting, etc., being repaired.
(g) Failure to find material or tools.

(f) Elimination of waste material.
1. Inspection.
2. Proper grading and saving of legitimate refuse.
3. Proper illumination.

(g) Methods of handling material.
1. Hand.
2. Truck, hand.
3. Electric truck.
4. Crane.

(h) Planning department.

The Foreman's Job.

(Each student is required to tabulate all of his duties for careful study and analysis during course.)

Large Factories.

1. Executive.
(a) To see that the orders of the planning department are carried out.
2. Not inspection.
3. Not disciplinary.
(a) Disciplinary measures would weaken his effectiveness as an executive.
4. No clerical work.

Medium and Small Factories.

1. Executive.
(a) Assignment of work to men.
(b) Inspection.
(c) Some clerical work.
(d) Not disciplinary.
2. Production.
(a) Know each man.
(b) Study and eliminate cause of waste time of workman.
(c) Study and eliminate cause of waste material.
(d) Study and eliminate cause of shut downs of machines.
(e) Reward faithful labor.
(f) General shop conditions, equipment and stock.
3. Instruction.
(a) Eliminate carelessness.
(b) A perfect understanding of each step.
(c) An absolute adherence to the method and sequence of operations.
(d) Material to be taught.
(e) Order of presentation.
(f) Methods of presentation.

A Study of Each Man's Job.

1. Listing of duties in order of productive importance.
2. Listing of duties in order of waste or scrap importance.
3. Suggestions which would tend to increase production, reduce cost, decrease waste.
4. Detailed analysis of each step in factory production.

Handling Stock and Tools.

1. Stock.
(a) Up-to-date systems of handling stock.
(b) Inventory systems.
(c) Stock inspection.
(d) Trucking systems.
(e) Location of stock room.
2. Tool room.
(a) Tool room methods.
(b) Location of tool room.
(c) Standardizing of tools.
(d) Tool inspection.

Maintenance of Equipment.

1. The effect of maintenance of equipment upon production.
(a) Time for belt and machine repairs including oiling.
(b) Cost of idle machines.
(c) Cost of idle man power.
2. Periodic inspection of equipment.
(a) Listing of equipment and intervals between inspections.
3. Periodic overhauling of each part of equipment.
4. Safety devices.
5. Fire protection and prevention equipment.
6. Maintaining good natural and artificial light.

The question of admittance will arise upon the formation of such a class. In order "to make a good showing" or "swell the reports" many an instructor has been urged to take "all who apply." The results are evident. In some cases many have enrolled who are not foremen and those having no natural leadership qualifications soon have lost interest. In a short time the originally large class has dwindled down to a mere handful. In other cases interest has been maintained, but the apparently successful class has resulted in no constructive work. Experience has proven that none should be admitted unless he be a foreman or a skilled workman in good standing and then in numbers not to exceed fifteen. If the enrollment is allowed to exceed this danger point, the method of instruction will of necessity be changed and the efficiency of the course will be greatly reduced. Large classes have been conducted under the lecture plan, but needless to say such a method has proven far less successful in a class composed, as this is, of hard working men after a day's work and with their minds not keen for organizing material presented in lecture form.

The difficulty of "getting the men out" to a conference in the evening has been answered through the cooperative efforts of the factory management and through fees or fines, but at no time has equal success been gained as when the meetings are held at some suitable time during the day at the shop. It is impossible to conduct the classes during the working day as is so well done for apprentices in Corporation and Continuation schools, but if cafeteria facilities are available, the men can easily assemble for lunch and conference at the close of the working day once, or preferably twice, a week. It will be found that the advantages of this plan are numerous but probably the most important are the economical use of time and the assembling of men while the problems of the day (the topics for discussion) are fresh in mind. These conditions surely warrant a full class with general and lively discussion.

The selection of an instructor or discussion leader is no small matter, because the ultimate success measured in terms of permanent achievement largely depends upon the man obtained for this work. It is difficult to get good practical, trained-engineering educators without liberal remuneration, but the results will more than compensate for the expenditure. In our larger

cities available material may be obtained through the University Extension or local technical institutions. Educators generally prove the right kind of leaders, although it must be understood that a happy cooperation must exist between the leader and the management, for it will be the teacher's duty to spend some time in the shop getting acquainted with the local organization, and the general problems which are peculiar to the individual factory.

Successful courses are being given through the Extension Departments at some central location, and in summer courses at the Universities, but these do not compare in "punch" and "follow up" to the courses given in the shop. The problem of the small shop naturally must be taken care of in some center, although the results obtained cannot be as definite, in view of the fact that the classes are composed of representatives from many different industries and shop organizations.

Because of the scarcity of leaders, in comparison to the demand, the plan of training instructors would be the first step to take in any broad constructive plan involving an entire city. The personnel of this training class would not, in this case, be educators, but qualified individuals from each shop. men who have been appointed or selected to take such a course as outlined at some central location. The following term or year these men would be the leaders of classes in their respective shops. There are many advantages of this plan, more especially the fact that the trained instructors would be more thoroughly acquainted with their individual shop organizations, the men, and the "secrets" of the plant.

The qualifications which should be possessed by the instructor naturally makes it difficult to always secure for the initial class the material which will be capable of carrying on the work. It is not always the "good talker" but rather a clear thinker, an organizer with originality, and one who commands the respect of his fellow foremen who should be selected for this training class. The "talker" might hold a class, keep up the interest and appear to be doing very successful work, but a little thought will show that entertainment is not always construction. The course above all things should; first, get the foremen to think and analyze their own problems; second, apply to them the methods and principles which will increase efficiency.

Chippendale Furniture

L. G. Martin, West Henrietta, N. Y.

THE Chippendale style in furniture developed from the work of Thomas Chippendale, who was a designer and maker of furniture, pier glasses and picture frames. He specialized on frames and chairs from 1735 to 1747. In 1754 he published "The Gentlemen and Cabinet Maker's Director," a book containing designs for various types and pieces of furniture and his style became firmly established and popular. His work showed the influence of various styles, Queen Anne, Gothic, French and Chinese, and his work is sometimes classified in those divisions.

Chippendale chairs between 1750 and 1760 were very elaborate. The legs had "dolphin" feet and the backs were of the ribband back type. The chair backs were also constructed with spiral whorls at the top corners. This developed into a more graceful curve. The "cupids bow" top rail was a favorite design and also the interlacing of the back splat.

Another type of top rail was one with a carved shell ornament in the center and quite sharp curves at each side.

Between 1755 and 1760 the cabriole leg was used extensively but later the straight leg was employed. It was used plain or ornamented with fretwork. Arm chairs were constructed with the arm continuing from the back to the seat in a series of curves and also with the arm projected beyond the support and finishing in a scroll. Chippendale corner chairs were a new type. The splats were similar to the other chairs and they were quite comfortable. Linen-fold swags, acorns, and oak leaves and tassels were used as design motifs in the carving. Chairs gradually became lighter and smaller.

Dining tables were formed by placing three small tables together to form one long table in the latter part of the eighteenth century. The tables had flat tops and carved legs with paw-and-ball feet.

Small card tables generally had cabriole legs ornamented with carved leaves. The connecting stretcher was also pierced or carved. Another type had sunken corners for holding tall candles which were used at that time. Recesses were also made to hold money.

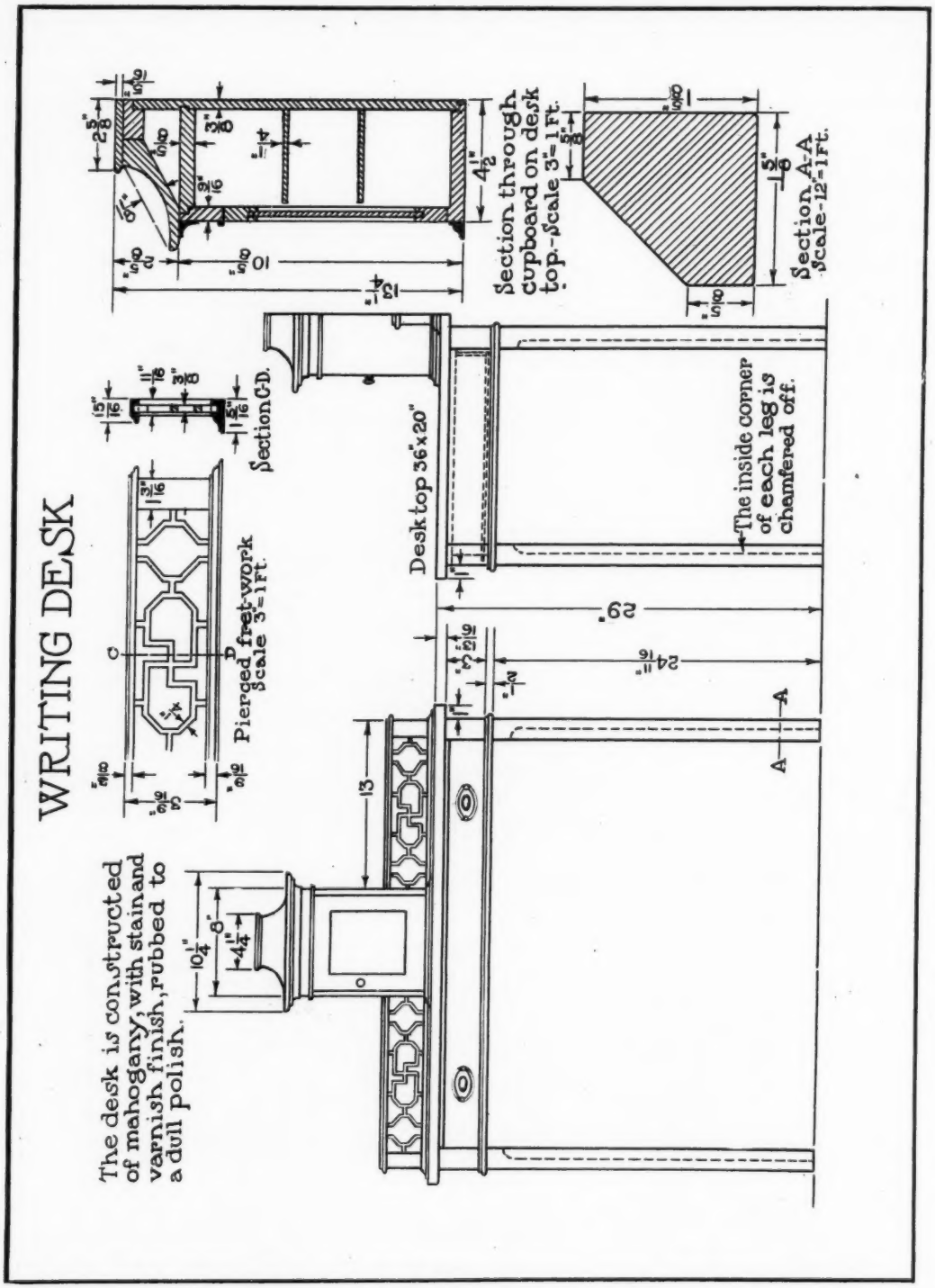
Small bureaus were popular and usually had sloping tops and drawer fronts with moulded edges which projected slightly. The bases were often veneered with figured mahogany and carved with rosettes, ribbons and gadroon mouldings.

Tripod furniture was a new feature of Chippendale's design, and many beautiful pieces were designed and made by him between 1760 and 1765. The small tripod-tables were constructed with a turned pillar in the center, generally having a bullous shape at the base, with spiral fluting. The pillar was also reeded or fluted on the upper part of some types. The table tops were made with moulded and scalloped edges which were also carved and pierced. The paw-and-ball foot was usually employed. Fretwork raised galleries were also used around the tops.

Pole screens for use before lights or fireplaces were constructed along similar lines. Acanthus leaves and cabochon were used in the carving. Candle stands and wash stands were quite common as were the adjustable reading tables in use at that time.

Chippendale designed many pieces in the Gothic style although there was little demand for Gothic furniture during the eighteenth century. One of the features of this style was the cluster column. Square legs were used extensively on chairs, and the backs were often built up with geometric patterns. Plain legs with block feet were used with this type of back. The Gothic chair backs gradually developed into a pierced splat of more refined type. Interlaced splats were made in

2. CHIPPENDALE CHAIR 1760-1780. A FINE CHAIR SHOWING THE GOTHIC INFLUENCE. THE TOP BACK RAIL AND FRONT LEGS ARE CARVED. THE BACK SPLAT IS PIERCED AND CARVED WITH SMALL ROSETTES. SMALL BRACKETS JOIN THE FRONT LEGS AND SEAT-FRAMING. THE UNDER-FRAMING IS PLAIN. THE CHAIR IS CONSTRUCTED OF MAHOGANY AND HAS AN UPHOLSTERED SEAT.
1. CHIPPENDALE STOOL-1760-1800 CONSTRUCTED OF MAHOGANY WITH CARVED FRETWORK ON THE LEGS AND SIDE RAILS. THE SEAT IS UPHOLSTERED AND COVERED WITH VELVET AND FINISHED WITH A NARROW BRAID AND FRINGE.
3. SIDE CHAIR, CHIPPENDALE STYLE, 1755-1760. MAHOGANY. THE FRONT LEGS ARE CARVED WITH FRETWORK AND THE STRETCHER IS PIERCED. THE TOP BACK RAIL AND SPLAT ARE CARVED WITH A LEAF ORNAMENT. THE SEAT IS PADDED.
4. SIDE CHAIR, MAHOGANY, CHIPPENDALE STYLE. THIS TYPE OF CHAIR IS KNOWN AS A "LADDER-BACK," AND WAS A CREATION OF CHIPPENDALE. THE BACK HAS A VERY GRACEFUL CURVE.
5. EARLY CHIPPENDALE CHAIR. IT HAS CABRIOLE LEGS WITH BALL AND CLAW FOOT. THE SEAT FRAME HAS ROUNDED CORNERS AND THE FRAME IS SHAPED. THE BACK SPLAT IS INTERLACED.
CHIPPENDALE'S WORK SHOWED THE INFLUENCE OF DIFFERENT STYLES, QUEEN ANNE, GOTHIC, FRENCH AND CHINESE. THE "GENTLEMAN AND CABINET MAKER'S DIRECTOR" WAS PUBLISHED IN THREE EDITIONS, 1754, 1759 AND 1762.
CHIPPENDALE FURNITURE

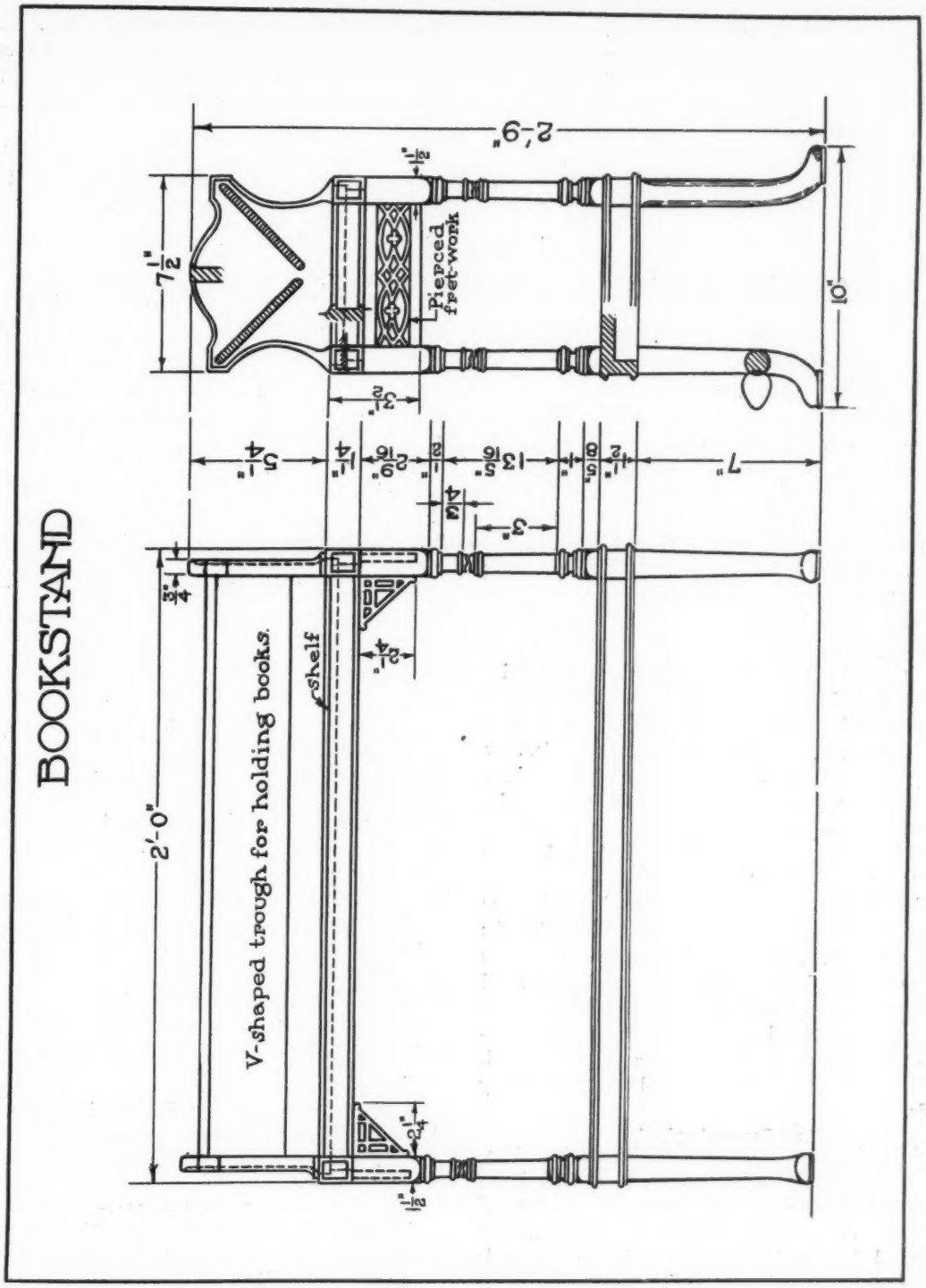


various designs. The next development of the interlaced splat was vertical piercing. The backs of some chairs were upholstered. The "drop-in" seat was most used after 1760.

Simple and ornate settees were constructed with fret-cut backs; this design was carried out on the legs and underframing as well.

The early tables had marble tops and many were built similar to desks, with a row of drawers on each side and triple cluster columns at the edges. They were also decorated with fretwork and carved pendant husks. Pierced brackets were employed to connect the legs and framing.

Small sideboards were introduced later with serpentine fronts. Fine bookcases were constructed with glass doors, inserting a tracery design in the upper part. A



cupboard formed the lower section which was often veneered and cross banded with mahogany.

Chests of drawers of fine figured mahogany were made with a writing drawer which pulled out. The drawers were usually beaded and the top and base were sometimes elaborately carved.

China cabinets were first made about 1760. A cupboard with glass doors, having a carved or scrolled pediment on the top formed the upper part and this cupboard was supported on a four-leg stand. Hanging cabinets were used previous to this period.

Chinese Chippendale furniture was very popular from 1755 to 1765 and displayed Chippendale's most advanced designs. Many pieces were ornamented with raised lacquer decorations. "Pagoda-tops" and pendant bell shapes were also features of this furniture. Lattice

work with rosettes was substituted for the splats in chair backs.

Mirrors were very costly and were elaborately carved and gilded. Beds were graceful four posters with a canopy top, with a valance and hangings at the sides.

About 1776 Chippendale worked for Robert Adam who was architect to the King of England. While the work of Robert Adam was of a classical manner, the work and influence of Chippendale was also seen. Later Chippendale adopted the French manner and his work lost some of its character. The French furniture had a lighter appearance and had fittings of gilded and chased bronze and brass.

The photographs are shown by the courtesy of The Metropolitan Museum of Art for Figs. 1, 2, 3 and the Philadelphia Art Museum for Figs. 4, 5.

A Model Steam Engine as a Shop Project

Frank Moeser, City School Department, Buffalo, N. Y.

(Concluded from October)

Connecting Rod.

The connecting rod may be made of brass, malleable iron, cast steel, or flat cold-rolled steel. If it is made from any of the first three metals, a pattern will be necessary. When this part is made of the flat cold-rolled steel, an opportunity is given the student for drill press work and some chipping, so we shall first consider the cold-rolled steel rod.

After cutting the steel to the right length, center up both ends. Draw a center line the full length of the rod and lay out holes on each side of the center as shown in the small drawing. By drilling these holes and chipping off the metal on the sides, a large amount of lathe work is saved. Care should be taken to drill each alternate hole through the rod on each side. By drilling the remaining holes, and if the rod has been laid out carefully and the holes are drilled accurately, there will not be very much trouble in removing the metal. When this extra metal has been chipped off the rod is ready for the lathe.

The operations in making a connecting rod are as follows: (1) Face off the ends to the correct length; (2) turn cross-head end to one inch diameter; (3) face crank end ¼″ thick and turn the center part to finished dimensions; (4) turn radius on cross-head end, file and polish; (5) lay out holes in both ends; (6) drill cross-head end with a 17/32″ drill and ream ⅝″; (7) drill the crank end with a 13/64″ drill, tap ¼″ twenty threads.

Cast Connecting Rod.

If a cast connecting rod is used there will not be so much work. It will not be necessary to center this rod so accurately because there will not be very much metal to remove. As most brass castings are very clean and smooth, all that will be necessary in the lathe is to file up the central part and polish it with emery cloth. The hole in the cross-head end of the rod can be made the same size as the cross-head pin as a bushing will not be necessary in the brass rod. The crank end will be split and fitted up in the same manner as the ends used on the flat steel rod.

If the cast steel or malleable iron is used for the rod, an allowance for finishing will be necessary on all parts of the pattern. Steel and malleable iron castings are usually very rough and should be used only when neither the brass or cold-rolled steel can be had for the rod.

Spacing Collar.

The spacing collar was used between the fly wheel and the main bearing. It was made from 1-⅜″ cold-rolled steel, grasped in the chuck and the hole drilled, bored and reamed. It was then pressed on an arbor and the sides faced to the required thickness and the outside diameter turned to size. Following are the operations necessary: (1) True up in the chuck; (2) drill, bore and ream a hole; (3) press on the arbor and face the sides and the outside diameter.

Fly Wheel.

The first operation on the fly wheel was to chuck it up true and turn the outside. The diameter of the wheel was not an essential point. All that was required of the boys was to obtain a smooth and straight finish. The side was faced next and the hole was drilled with a 9/16″ drill. A small boring bar was used to true up the hole after which it was reamed with a ⅝″ reamer.

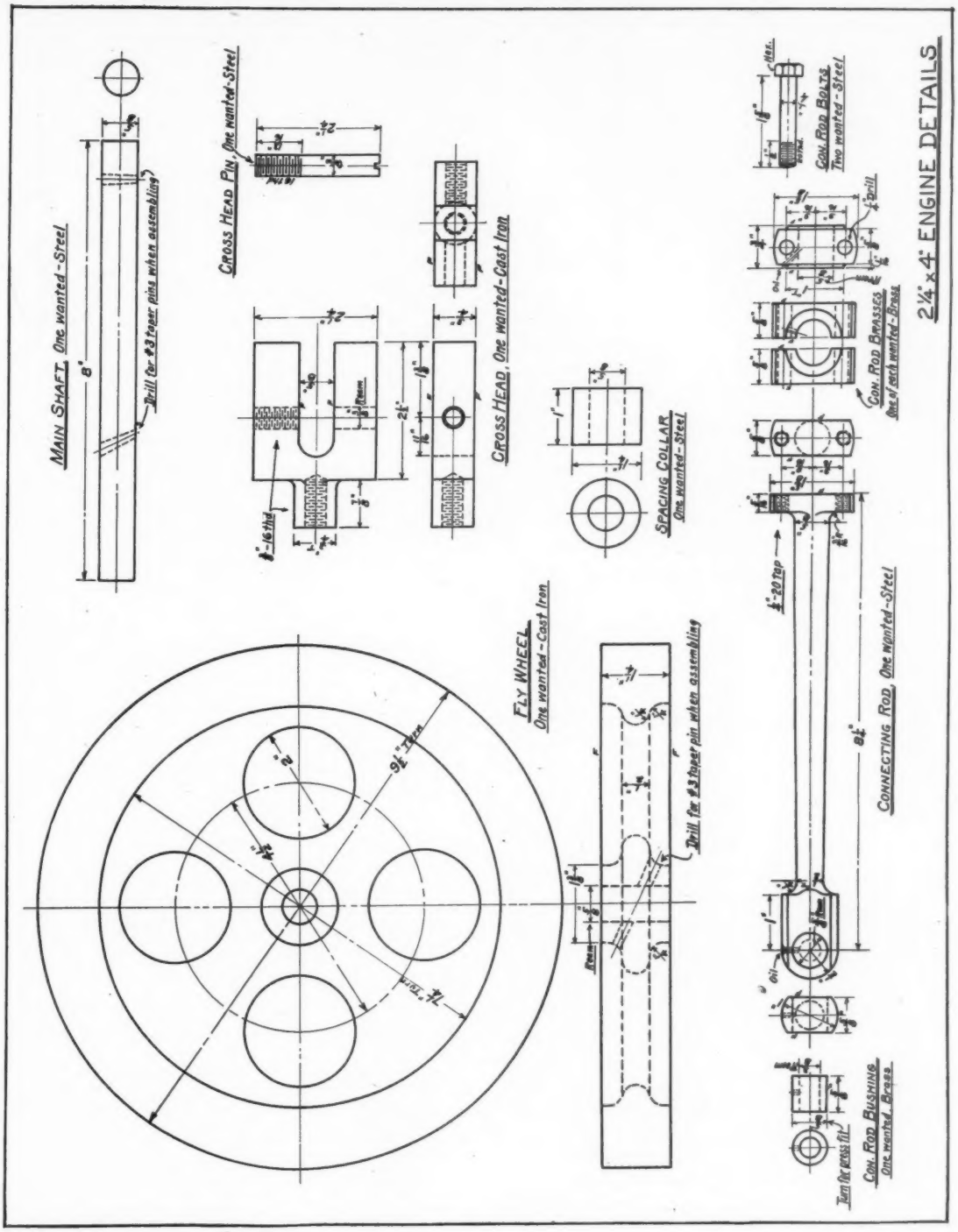
For finishing the opposite side of the wheel, a plug, as shown in Fig. 5, was inserted in the spindle of the lathe and the face plate was screwed onto the spindle. This method was used because the hole in the wheel was so small that if an arbor had been used, a satisfactory finish could not be obtained due to the spring or chattering.

The operations for the fly wheel are: (1) Chuck up true; (2) turn the outside diameter; (3) face the side; (4) drill, bore and ream a hole; (5) face the opposite side; (6) file and polish.

Connecting-Rod Bushings.

The connecting-rod bushing was made from a piece of ¾″ brass. It was first chucked up true in the lathe chuck and a 5/16″ hole was drilled to the proper depth. A small boring bar was used to true up the hole and it was reamed out with a ⅜″ reamer.

The outside diameter was turned to size and the bushing was cut off and pressed into the rod. After pressing the bushing into the rod, a ⅜″ hand reamer was used to ream out the hole and remove burrs and projections which had arisen when pressing the bushing into place.

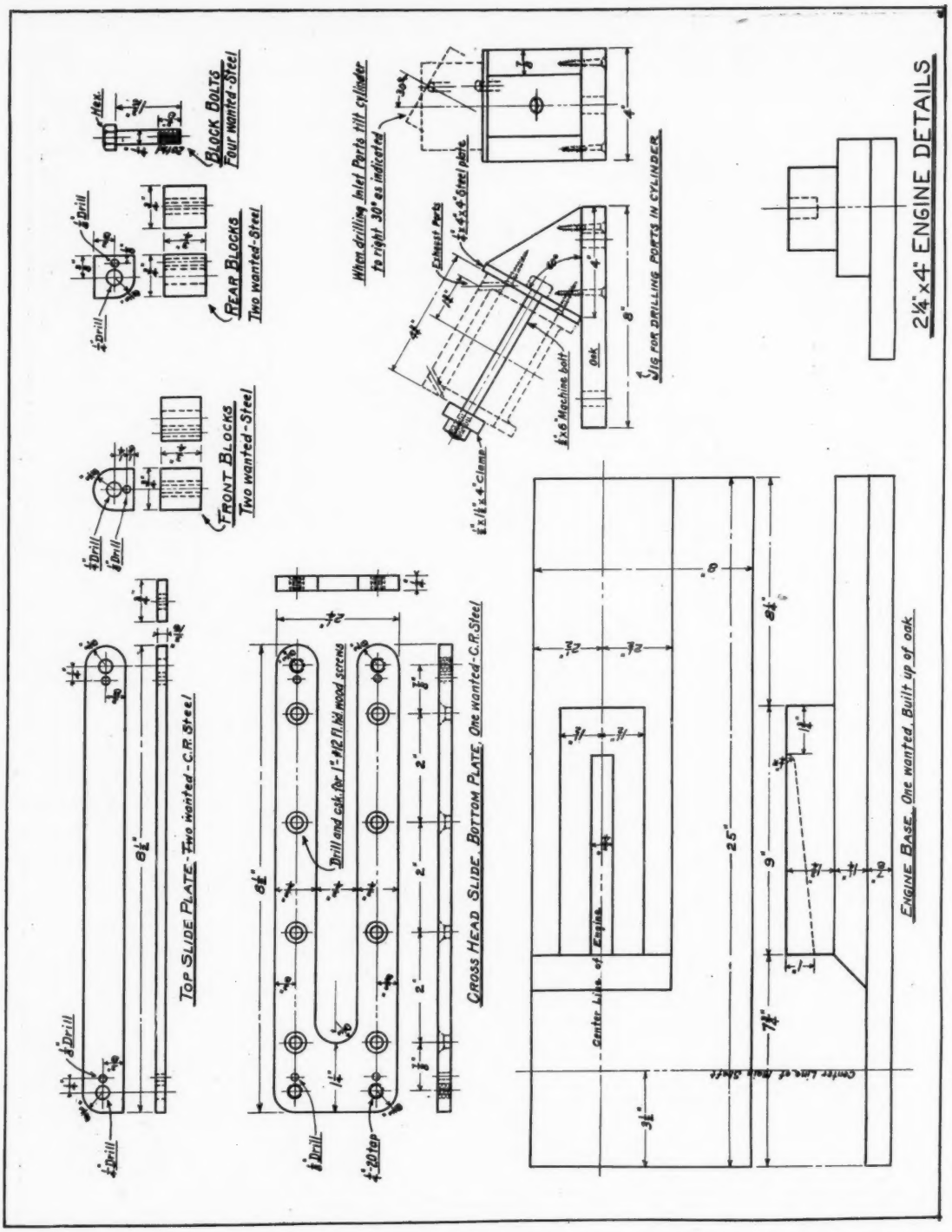

2¼ x 4" ENGINE DETAILS
MAIN SHAFT. One wanted - Steel
Drill for #3 taper pins when assembling
CROSS HEAD PIN. One wanted - Steel
CROSS HEAD. One wanted - Cast Iron
SPACING COLLAR. One wanted - Steel
FLY WHEEL. One wanted - Cast Iron
Drill for #3 taper pin when assembling
CONNECTING ROD. One wanted - Steel
CON. ROD BOLTS. Two wanted - Steel
CON. ROD BRASSES. One of each wanted - Brass
CON. ROD BUSHING. One wanted. Brass
Turn for press fit

The following operations are necessary in making connecting-rod bushings: (1) Chuck up true in the lathe chuck; (2) drill, bore and ream a hole; (3) turn outside diameter and cut off; (4) press into the rod; (5) ream the hole with a hand reamer.

Connecting-Rod Brasses.

The brasses or end bearings for the connecting rod were cut from a bar of ⅝″ x ¾″ flat brass. The first operation was to lay out the ¼″ holes for fastening to the connecting rod. Two bolts were used for fastening the end pieces together and the ⅝″ hole for the crank pin was laid out exactly in the center of the two blocks. (See detail drawing.)

A ⅛″ hole was drilled through first, followed by a 17/32″ drill and a ⅝″ reamer. By using the small drill first and following through with the larger, a more accurate job was obtained. After the hole was drilled and reamed, the end pieces were pressed upon an arbor


2¼"x4" ENGINE DETAILS
Block Bolts Four wanted-Steel
Rear Blocks Two wanted-Steel
Front Blocks Two wanted-Steel
Top Slide Plate-Two wanted-C.R. Steel
Cross Head Slide. Bottom Plate. One wanted-C.R. Steel
Engine Base. One wanted. Built up of oak.
Jig for drilling ports in cylinder
When drilling Inlet Ports tilt cylinder to right 30° as indicated
Exhaust Ports
Drill and csk. for 1" #12 Fl. Hd wood screws
Center Line of Engine
Center Line of Main Shaft

and the sides relieved as shown in the detail drawings. The arbor was pressed out of the hole and a small oil hole was drilled through one of the brasses. All that remained to be done was to screw them into place on the rod and file the top and bottom of the brasses to the same shape as the end of the rod.

The operations are as follows: (1) Cut off two pieces 1-⅝" long; (2) drill ¼" bolt holes; (3) lay out. drill and ream a ⅝" hole; (4) press on the arbor to relieve the sides; (5) drill the oil holes; (6) bolt it into place and file to shape.

Main Shaft.

For the crank shaft of the engine we used common ⅝" cold-rolled steel. A turned shaft would be more desirable but, inasmuch as we were limited in our machine equipment, we did not attempt to turn the shaft from larger stock. If the equipment is available the turned shaft would be used.

Piston Rod.

The piston rod was made from 7/8″ cold-rolled steel. The first operation was to center up both ends and to rough turn all dimensions 1/16″ larger than required. After all roughing has been done, finish turn the cross-head end and cut the threads.

For finishing the piston end, two nuts should be placed on the cross-head end and locked together. By placing the dog on these two nuts, marring of the threads or other finished part of the work will be avoided.

The necessary operations are: (1) Cut off 7/8″ steel 7-1/2″ long; (2) center both ends; (3) rough turn over all; (4) finish cross-head end and cut the threads; (5) finish the piston end and cut the threads.

Cross-Head Pin.

This pin can be made up in either of two ways. One way is to center both ends and finish the pin between the centers of the lathe in the same way that the piston rod was finished. The objection to making the pin in this way is that the center hole in the end may interfere in obtaining a good screw slot. The other method is to take a long piece of 1/2″ or 7/16″ steel and true it up in the chuck, allowing enough to extend past the chuck jaws to enable the parting tool to work properly. It will be necessary to center the end which extends out of the chuck, for the greater distance between the chuck and the tool, the greater will be the spring in the work. By centering this end and screwing in the tail center the shaft will be more steady and a better cut can be taken over the work.

The steps in making a cross-head pin are: (1) Rough turn; (2) finish turn; (3) cut threads; (4) file and polish; (5) cut off.

Complete Cross Head Slide.

The bottom part of the cross-head slide was cut from a bar of flat, cold-rolled steel. The first operation was to cut out the slot in the center to provide for clearance for the connecting rod. To do this we scribed a line through the center and laid out 5/8″ holes on 9/16″ centers, or we allowed 9/16″ from the center of one hole to the center of the next; then drilled a small hole through these centers and followed with a 5/8″ drill. By laying out and drilling in this manner we avoided a large amount of unnecessary sawing and chipping.

The screw holes were laid out, drilled and countersunk, and the holes in the ends were drilled and tapped. The sides of the slot were filed smooth, and the ends were rough ground.

The top parts of the slide were cut from a 3/16″ x 3/4″ cold-rolled steel bar, and the end holes were drilled with a 1/4″ drill. The spacing blocks were cut from a 3/4″ square bar of cold-rolled steel and the ends were filed square with the sides. The 1/4″ holes were laid out and drilled through the center of each block.

The entire slide was then assembled and the small 1/8″ holes were drilled through the top, spacing block and bottom. The pins were driven in place and the ends were rough ground on the emery wheel, then finished smooth with a file and emery cloth. The bottom part of the slide was screwed in place in the base of the engine and then draw filed smooth and scraped. The top plates and spacing blocks were again replaced until the entire engine was ready for assembling.

Cross Head.

The cross head should have been finished on a shaper or a milling machine, but by rigging up the face plate of the lathe, as shown in the accompanying sketch, we finished the job nicely.

The first operation is to center both ends with a center drill. Next, place it between the centers of the lathe and turn the piston rod end to 3/4″ diameter and to the required length. Place the cross head between the centers on the face plate and, after securing it in place, face one side down to the diameter of the piston rod end. Now reverse the cross head and finish the other side.

Some difficulty may be experienced in facing both sides parallel, but if a light cut is taken when finishing the last side and a caliper is used to measure the difference in the thickness of the sides, the adjusting screws can be manipulated to minimize any difficulty.

When both sides were finished to the required thickness, the cross head was removed from the lathe and a 5/8″ hole was drilled through the center. The remaining metal from the end of the head to the 5/8″ hole was cut out with a hack saw and the sides were filed smooth to the required width. The holes for the piston rod and for the cross-head pin were then drilled and tapped.

The necessary operations for the cross head are: (1) Center the ends in the drill press; (2) turn the piston rod end to 3/4″ diameter; (3) place in the fixture on the lathe and face one side; (4) reverse the head and face to size; (5) drill 5/8″ hole, saw, file and finish the slot for the connecting rod; (6) drill and tap holes for the piston rod and for the cross-head pin.

Base.

The base of the engine was made from 7/8″ red oak. This was the best material available and as we had no machine capable of machining a casting of this length a cast-iron base was out of the question. The wood was cut to the required lengths, glued and screwed together. The part for the cross-head slide was bolted onto the other two pieces with four 1/4″ bolts.

Assembling.

As has been stated before, different parts of the engine were assembled by the boys while they were awaiting their turn on the machines. For example, the base of the engine was the first part to be completed by most of the boys. After all of the machine work had been finished on the cylinder and heads, these parts were assembled and their location determined on the base.

The cross-head slide was screwed into place and when the cross-head and piston rod had been completed these parts were assembled and fitted up to run smoothly back and forth in the way in which they

would run. All of the other assembly work was carried forth in this manner until the entire engine was completed.

To say that this was an interesting project for the boys would be putting it rather mildly. The entire school year was devoted to the building of these engines and if some of the readers could see the boys while they were working and hear some of the comments out of school, there would be no doubt in anybody's mind that this was a real, live, interesting job.

A Neglected Phase of Vocational Guidance

D. J. MacDonald, Professor of Vocational Education,
University of Cincinnati

DURING the past year the writer was engaged with others in a thorough survey of the vocational guidance movement. In view of the fact that again and again we came face to face with the question as to the specific occupations into which juvenile workers go, it seems justifiable to consider this point at length.

A comprehensive program of vocational guidance ordinarily comprises cumulative school records, intelligence quotients, information relative to social environment, ancestral background, etc., and the employment record of the juvenile, in case he has had employment. With this program—so far as it goes—no one can find fault. But when the vocational guidance officer faces the real problem of advising young persons regarding employment, or even regarding future educational courses, the writer fails to see how such advice can be intelligent in character, unless this officer has a rather thorough knowledge of the specific occupations which are open to such young persons, regardless of whether they leave school at once or remain in school indefinitely. Wide spread investigation of this point revealed very little reliable information.

Lack of such information lessens the effectiveness of vocational guidance in yet another way. Not long since the writer was in conversation with a grammar school principal who had recently conducted a survey of the industries in his school district, and upon the strength of this survey, was establishing prevocational classes in printing, sheet metal work, electrical work, and carpentry in his school. His response to my query as to whether he had any reason for believing that the pupils from his school were entering the industries for which he was establishing classes, was negative and when I suggested that, in my judgment, it would be very desirable for every principal to have on file in his office the employment history, at least of a majority of his pupils, for the three or five years following termination of their school life, he agreed. Being a man of ready action, he instituted an investigation of this character soon thereafter. When I saw him some weeks later, his first remark was to the effect that his investigation showed that approximately one-half of his boys and girls were going into clerical work, and that as a result of this information, he intended to establish, if possible, commercial classes. I have a suspicion that the kind of commercial work introduced in his school was traditional in character and that as a result, if he had followed up the pupils who took this work, he would have found-- as was found by the people who are responsible for the "Survey of Junior Commercial Occupations," published by the Federal Board for Vocational Guidance-- that relatively few young persons under 18 years of age, at least in cities in which the surveys were conducted, are using in the offices the training received in school.

An interesting sidelight of similar character, is found in the recent report on juvenile employment in New York City, the essentials of which are:"Stenographers and typists under 17 or 18 years of age are a drug on the market. Applicants for this class of positions, under this age, especially where they have not had the equivalent of a high school education, even though they show graduation from a school where they have specialized in these subjects, have the greatest difficulty in getting such employment at any price. The proportion of such applicants who fail to secure openings in the work for which they have been trained is shown to be in the Brooklyn office 67 per cent, in the two Manhattan offices 80 percent and 86 percent respectively. It is possible, to be sure, that the present industrial depression is an important factor in this situation. It is also possible that the same conditions would not be found to prevail outside of these cities. The first statement, if true, reminds us most forcibly of the fact that the schools, as well as other social institutions are immediately susceptible to industrial depressions and that, therefore, one might not be justified in basing deductions upon the employment figures for any one-year or three-year period. The second should serve as a warning to any one who is inclined to be satisfied with figures of this character quoted by another city. The only kind of statistics which may be safely used in any locality are those which tell the story in that locality.

Do not both of these citations go to prove the necessity of having specific information not only regarding occupations into which juveniles of the different ages go, but as well of the definite requirements of those occupations? How can a school officer safely recommend the establishment of prevocational, or even vocational courses, in his school, unless he knows rather

well whether or not pupils who take these courses are likely to find employment which will permit the training received to function. If he does not know this--a state of affairs which, sad to relate, is more often than not true--then he cannot be said to be acting either in the interests of the community or of his pupils. In fact, the necessity of securing information of this character, regarding his former pupils, is apparent even after he has established vocational classes. There is no other way for him to know how fully his school is meeting the needs of his pupils and the community.

Apropos to this is the well known experience of those who were responsible for the establishment of our technical high schools and their immediate predecessors, the private mechanical institutes. As is well known, their advocates firmly believed that by establishing such schools, they would thereby immediately swell the number of first-class mechanics, skilled men who could and would work at machine and bench. But a comparatively recent investigation showed that less than three per-cent of the graduates of such schools are found after five years among the ranks of mechanics; rather that they are occupying, almost without exception, executive positions. It remains to be seen whether the same thing is happening regarding our present prevocational and vocational courses. Assuredly, we should not go on assuming, as did the above referred to individuals, that certain things are happening when they are not. Why not get hold of the information, the employment records, if you please, of at least a large majority of the boys and girls who leave our schools each year and ascertain without a shadow of a doubt what those boys and girls are doing? A notable instance of the kind of information needed, though it should be more elaborate in character, is that found in a recent report of the Children's Bureau of the United States Department of Labor on "Industrial Instability of Child Workers." Surely, until we secure such data, we have no right to lay claim to scientific procedure, either in the vocational or the educational fields.

Art-Fiber: A New Material for the School Shop

H. H. Harrison, Director of Manual Training, Marshall Public Schools, Marshall, Mich.

SINCE wood has soared to the present high prices, it is indeed fortunate that of late the tendency is to use other materials in conjunction with wood, or in place of it, in many shop classes. Materials such as cane, splints, rattan, leather, cretons, etc., have helped much, but now we have an entirely new material which is very different and yet combines readily with the others.

This new material is a twisted paper called "Art-Fibre" which closely resembles reed or rattan. It can be bought in several different sizes and two colors "Natural" white and "Kraft" brown. The cord, for weaving, is soft and pliable, while the stakes for spokes, are stiff with a wire center. It has the advantage of always being in a working condition and not requiring soaking in water. Art-Fibre can be recommended for everything for which reed and rattan are adapted and also many other projects.

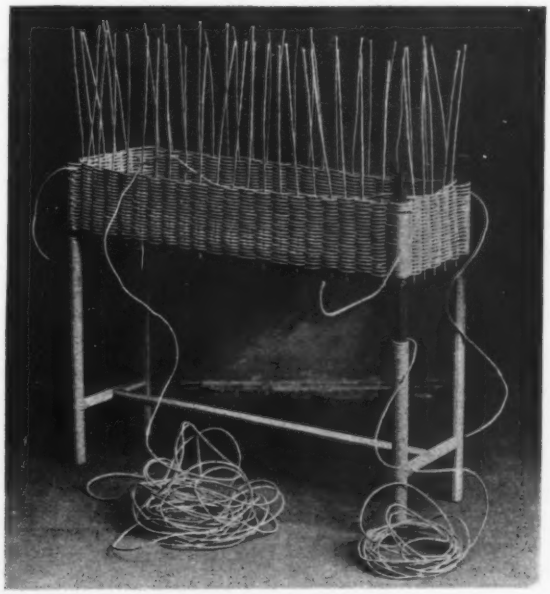


FIG. 3.—WEAVING THE BODY, FILLING IN THE POSTS AND WRAPPING THE LEGS.

FIG. 4.—FERNERY COMPLETED.

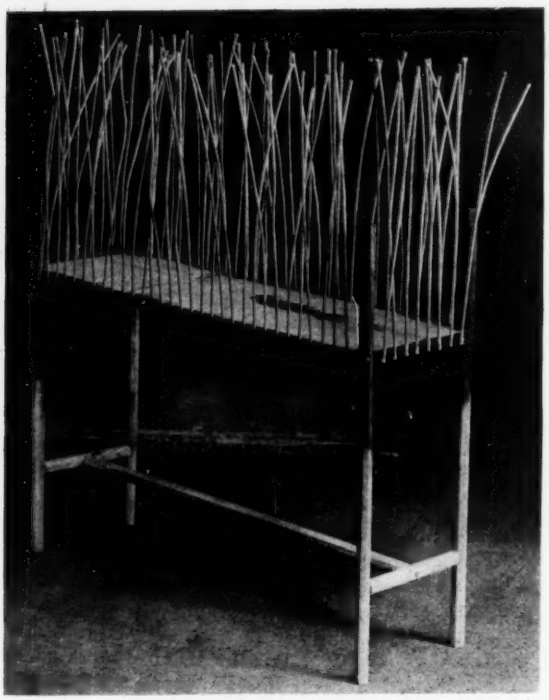


FIG. 2.—THE FRAME. STAINED AND WITH THE STAKES IN PLACE.

The title says, "New Material," but really it is not entirely new as the writer has been using it for several years and such men as Edward F. Worst, Supervisor of Elementary Manual Training and Construction Work, Chicago Public Schools, Chicago, Ill.; Harry E. Wood, Director of Manual Training, Indianapolis Public Schools; James H. Smith, Supervisor of the Principal's Course, Whitewater State Normal School, Whitewater, Wis.; and others have written articles dealing with paper cord. Still it is a material that is little used and it is with the hope that some instructors not now acquainted with it will soon find it a great help, that the following article is submitted.

The equipment necessary to do the work is very simple and everything needed with be found in the average school shop. In fact, a shop is not essential at all in a large part of this work. A few necessary tools and materials are: hammer, tin snips, round nose pliers, brace, bits, nail sets, spikes, nails ¾″ No. 18 and varnish or shellac.

The price of Art-Fibre is very moderate, so that the cost of the articles in Fig. 1 are as follows: fernery $1.00, stool top 50c, tray 35c, and the piano lamp (shade included) $1.50.

The field of work with this material is very large, varying from a small mat to a large upholstered chair. Many writers have articles or parts of books dealing with projects in the construction of which this material may be used and where those interested may find help, therefore this article will give but a few details.

Fig. 1 shows a group of Art-Fibre projects made in the author's classes. It will be noticed that such projects as baskets, mats, vases, etc., are lacking; this is because the articles shown were made by High School boys, while the mat and basket weaving is given by another instructor to boys of a lower grade.

THE FERNERY.

The fernery, Fig. 4, is one of the most popular projects among the boys and one of the most simple to construct. It has been varied as to shape and size many times and the lower cross pieces changed or a fancy design added between the legs, but always it has proved successful. In general the procedure is as follows:

A. *Frame.* Rigidity is the big essential, so oak was used for the legs and cross pieces, white pine for the bottom, and 2″ No. 10 screws for fastening. The oak was inch material and after it was cut to length it was ripped one inch square and then octagon. The octagon shape helps grip the paper cord in winding but still gives a round appearance. The white pine bottom was made of inch material and notched at the corners to receive the legs which were screwed on with the screws entering cornerwise. This helped to make it rigid. Fig. 2 shows clearly how these were assembled. Staining as shown in the same figure will help hide any breaks in the Art-Fibre which would otherwise show white when the finish darkens the paper.

B. *Body.* In building up the body, 5/32″ Wire Stakes were used and tacked on the frame as in Fig. 2. The stakes next to the posts were only ½″ from them while all the rest were about 1½″ apart. Any book on reed or rattan work will give several methods of weaving-in the body, but the method used here dealt with

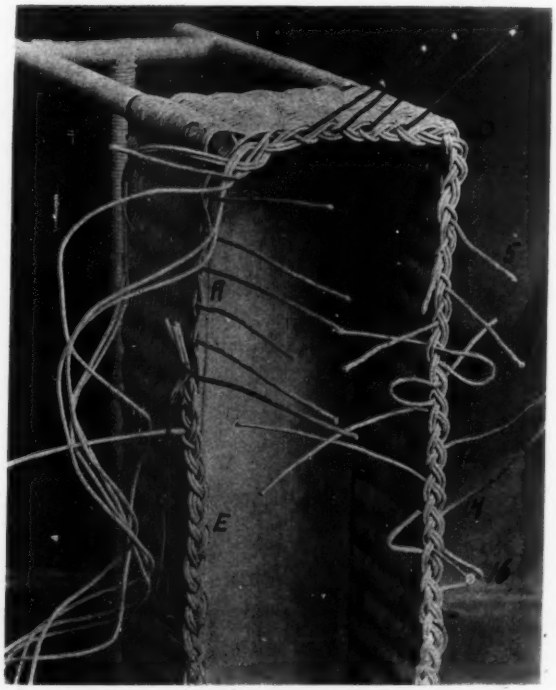


FIG. 5.—WEAVING THE BRAID.

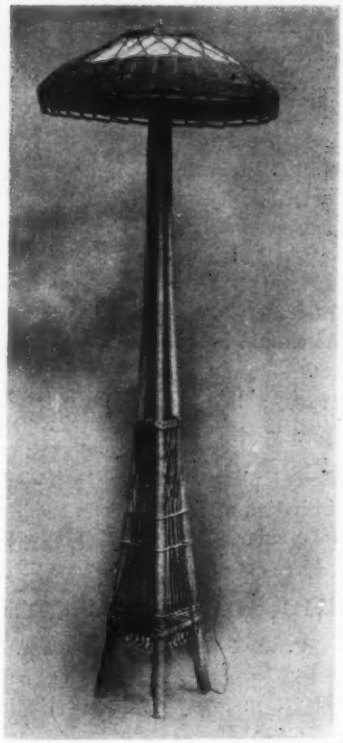


FIG. 1.—SOME ART FIBRE PROJECTS MADE IN MARSHALL HIGH SCHOOL.

the single weaver calling for an odd number of stakes. The corners or posts were filled in by introducing the extra pieces at each corner, and with them wrapping in the spaces left by the weaver in passing around the posts.

C. *Legs.* In wrapping the legs the material as in Fig. 3 is tacked at the bottom of each leg, tightly wrapped and then tacked again at the top. Next wrap the short cross pieces and lastly the long one. This same illustration shows clearly the method of wrapping the joints.

D. *Braid.* The braid around the bottom board is made up of six pieces of cord each as long as one and one-half times the distance around it. This braid is woven off the fernery and then tacked on as shown in Fig. 4. If care is taken, the ends may be tacked in place so as to be completely invisible. In all the tacking on of the braid use a nail set and hide the nails as much as possible.

The top braid is really the most difficult part of this project to make. Many books give several different ways of putting on a braid or finished edge but the author thinks the method here shown is the most satisfactory as it hides the corner posts better than many others. Fig. 5 shows this method which is as follows: Five pieces of Art-Fibre B, each as long as one and one-half times around the top, are braided together. A shows the stakes ready to receive the braid. Stakes 1, 2, and 3, show the wrong placing of the stakes through the braid and 4, 5, 6, 7, and 8 the correct. Notice that only the single strand should pass around the standing stake. When a corner is reached C, one of the stakes is taken up and braided with the five strands until the next stake around the corner is reached. The braid should then be nailed to the corner post. D shows the finished corner. This still leaves the stakes between the posts standing. Stakes 9 and 10 illustrate clearly the next step in weaving them into the braid. Stakes 11, 12, 13, and 14 have been pulled snug. The last step is shown by stakes 15 and 16 which are cut off and bent so that the end of stake 16 will slip in where the nail is. This leaves a smooth top and is also very solid as about three inches of stake 16 will lie next to a stake in the woven body. E shows the finished braid. When the braid reaches all the way around, the long ends are cut off and braided together making it endless.

E. *Finish.* There are several different ways of finishing the projects. The shade may be varied by using a stain, but the writer has been more successful with a dark or colored varnish. The Art-Fibre should be given a thin coat of glue sizing after the project has been finished and before any finishing materials are applied. This sizing stiffens the material and makes it impervious to water and at the same time gives it a proper surface for finishing. A very little glue sizing will hold the finish on the surface and thereby save a large expense as only one coat of varnish or shellac will be necessary. A cheap grade of ground animal glue made thin enough to easily apply with a brush and so it will run off quickly, will give a smooth hard surface. It is better to work it too thin at the start, giving it two coats of glue if necessary, rather than get it too thick. Most of our ferneries have been finished this way and the result has been a brown color with a high gloss which is very pretty and harmonizes well with the plants.

The plants may be placed in the fernery in pots or a tin container made, to fit the fernery, and this filled with dirt.

Bill of materials for the fernery:

Bottom board. 1 piece white pine 1″x10″x32″.

Legs. 4 pieces oak, octagon in shape, 1″ between faces, 28″ long.

Cross pieces. Same as legs, 2 pieces 8″ long, 1 piece 26″ long.

Art-Fibre. 4½ pounds including 47 stakes 18″ long.

Finish. Glue sizing, 1 coat varnish or shellac.

Container. Galvanized tin box.

THE PIANO LAMP.

The piano lamp as shown in Fig. 1 was suggested to the author by a similar lamp, in the local furniture store window, which was priced at $25.00. This one cost about $7.00.

The frame is composed of three pieces of oak, cut octagon, 1″ between faces and 6′ long. These were steamed and bent into the curve shown, braced with two triangular cross pieces and then fastened together at the top. A hole was made through the top and both cross pieces for the electric cord.

The legs were first wrapped as in the fernery, then fastened together, the fancy design tacked on and lastly a braid was nailed around the cross pieces.

Directions for shade making may be easily obtained. Cretons and silks make harmonious linings.

THE FOOT STOOL.

The foot stool, Fig. 1, shows a different phase of the Art-Fibre work. The top is a good imitation of the old rush seating and may be made rectangular if so desired. As a substitute for rush in renewing seats in chairs, it is very successful. For full directions see "Problems in Woodwork" by Edward F. Worst.

THE TRAY.

The tray shown in Fig. 1 is only one of many beautiful designs which can be easily worked out. Besides its beauty, it has the advantage of being light. "Industrial Work for the Middle Grades" by Edward F. Worst, shows several fine shapes and borders.

OTHER PROJECTS.

The articles shown are but a few of the many projects for the construction of which Art-Fibre is adaptable. The frames for table lamps, tea wagons, lemonade trays, etc., may be bought from Louis Stoughton Drake, Inc., 38 Everett St., Allston, Mass. The method of constructing baskets, mats, napkin rings, etc., may be found in: "How to Make Baskets," "More Baskets and How to Make Them," both by Mary White, published by Doubleday, Page & Co., New York City.

Home Made Machinery

C. W. Frost, Philipsburg, Mont.

(Second Article)

THE Jig Saw is designed for use in heavy stock where it is impossible to use a band saw; for cutting out marqueterie patterns and art metal work; and for the use of pupils whom it is deemed inadvisable to trust with the band saw.

The saw frame and clamps will hold any kind of saw blade between four and eight inches in length, from the finest "jewelers'" saws to a quarter inch power jig-saw blade, including the common loop and pin end coping saw blades, and jewelers' hack saw blades.

The crank shaft is provided with threaded screw holes at different distances from the center of the shaft, by means of which the length of saw stroke can be regulated, from half an inch for marqueterie and art metal work, to an inch and a half for cutting heavy stock such as drawer openings in table rails, etc.

The drawings of the jig saw show but one diameter of pulley, but that used in this school is belted to the shaft of the combination disk and spindle sander, which machine is provided with double step pulleys for varying its speed to produce the best results with both spindles and disks. Th jig-saw operator has, therefore, the choice of two speeds by merely shifting the drive belt on the sander. The same results can be obtained by including a counter shaft in the frame of the jig saw.

The sander used in this school is arranged to make 557 R. P. M. with the low speed used with the disk, and 1470 R. P. M. with the high speed required to do the best work with the spindles. The jig-saw drive pulley

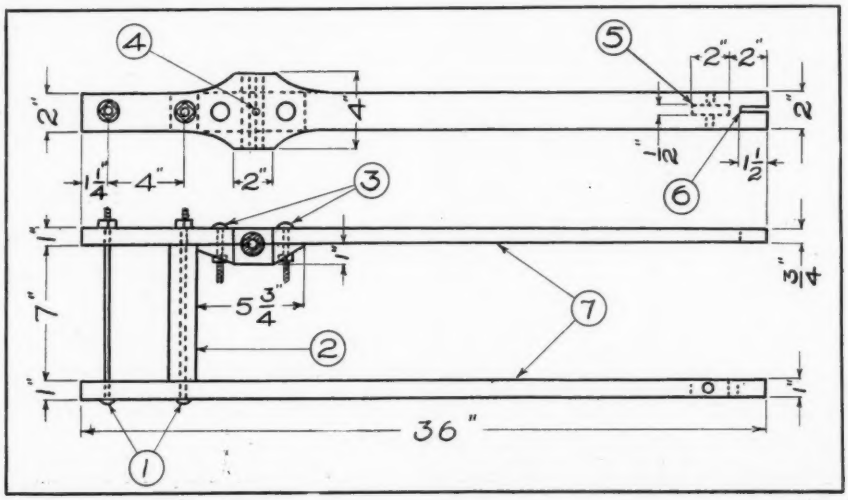
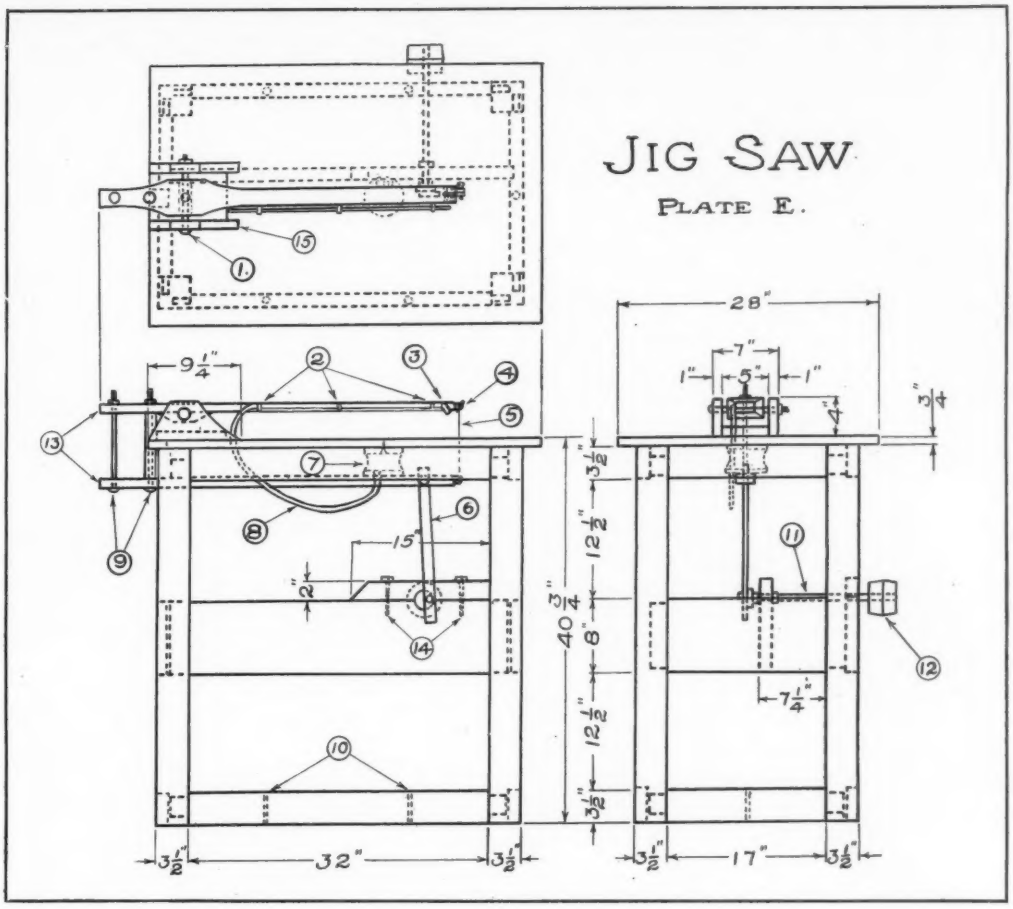


PLATE F.


JIG SAW
PLATE E.
28"
7"
1"
5"
1"
3/4"
4"
9 1/4"
15"
2"
40 3/4"
8"
12 1/2"
12 1/2"
3 1/2"
7 1/4"
32"
17"

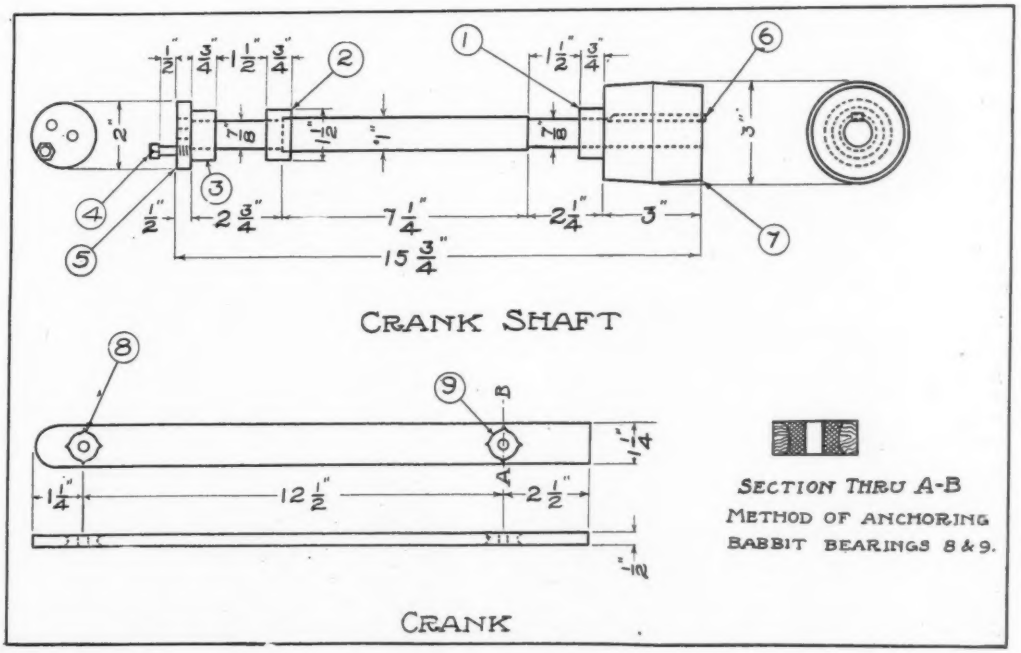

CRANK SHAFT
2"
2 3/4"
7 1/4"
2 1/4"
3"
15 3/4"
CRANK
12 1/2"
2 1/2"
1 1/4"
SECTION THRU A-B
METHOD OF ANCHORING
BABBIT BEARINGS 8 & 9.

PLATE G.

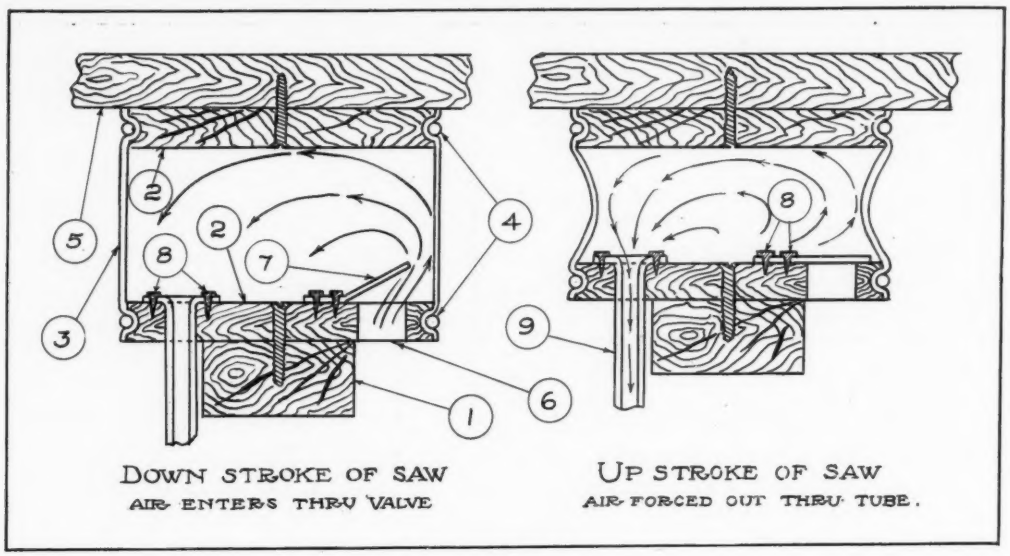


PLATE H.

on the sander shaft is two inches in diameter, that on the crank shaft is three inches, therefore the jig saw makes 371 strokes per minute on the low speed, and 980 on the high speed. Probably it would be an advantage to provide the machine with two additional speeds; one for metal work of about two hundred strokes per minute, and another, for heavy work with wide blades, of about twelve hundred strokes per minute. This could readily be done with either a counter shaft, or drive from the sander shaft.

A blower to keep the surface of the work in front on the saw free from dust is an essential part of any power driven jig saw. That shown in the drawings is of the simplest form, and works quite satisfactorily. The diameter of the wooden disks forming the top and bottom can be varied to fit any size of inner tube available.

Parts of the Jig Saw.

Plate E.

1. Saw frame axle (carriage bolt ¼″ x 8″).
2. Screw eyes holding blower tube to saw frame.
3. Blower nozzle (¼″ auto oil feed pipe).
4. Upper saw clamp.
5. Saw blade.
6. Crank.
7. Blower.
8. Blower tube (¼″ rubber tube).
9. Tension screws (¼″ x 8″ carriage bolts).
10. Holes for lag screws to fasten machine to floor.
11. Crank shaft.
12. Pulley.
13. Saw frame.
14. Lag screws (¼″ x 3″).
15. Cap to bearings.
16. Lower saw clamp.

Plate F.

1. Tension screws (carriage bolts ¼″ x 8″).
2. Tension block.
3. Carriage bolts (¼″ x 3″).
4. Oil hole.
5. Slot for crank.
6. Slot for saw clamp tang.
7. Saw frame arms.
8. Babbit bearings.
9. Hole for crank axle.

Plate G.

1. 2. 3. Babbitt collars.
4. Crank axle.
5. Eccentric disk.
6. Key.
7. Pulley.
8. 9. Babbitt bearings.

Plate H.

1. Lower arm of saw frame.
2. Wooden disks, top and bottom of blower.
3. Section of inner tube.
4. Wire belt lace binder.
5. Saw table.
6. Air intake hole.
7. Valve.
8. Tacks.
9. Air outlet tube.

Material for Jig Saw.

4 pieces pine 4x4x40—18 ft. B. M. @ $100 M	$1.80
4 pieces pine 2x4x36—10½ ft. B. M. @ $75.00	.79
2 pieces pine 2x10x36—10 ft. B. M. @ $75 M	.75
2 pieces pine 2x10x24—7 ft. B. M. @ $75 M	.53
1 piece pine 1x28x42—9 ft. B. M. @ $75 M	.67
2 pieces pine 2x2x15—1 ft. B. M. @ $75 M	.08
1 piece oak 1x4x36—1 ft. B. M. @ $350 M	.35
1 piece oak 1x2x36—½ ft. B. M. @ $350 M	.18
I piece walnut ½x1¼x12½	.05
1 ½ bird drivel rod	.08
1 crank shaft turned at a local garage per details shown in Plate F	2.00
3 carriage bolts ¼″x8″	.10
10 carriage bolts ¼″x3″	.20
4 stove bolts ¼″x3″	.08
18 quarter inch washers	.05
12 three-eighths inch washers	.05
6 three-eighths inch screw eyes	.05
6 lag screws ⅜″x6″	.12
1 piece copper oil feed pipe ¼″x4″	...
3 feet rubber tubing ¼″	.30
Total cost of Jig Saw	$8.74

(To be continued.)

Drawing and the Project Method

Helen M. Stockton, State Normal School, Trenton, N. J.

THE importance of drawing as a factor in the project method of education can not be over estimated.

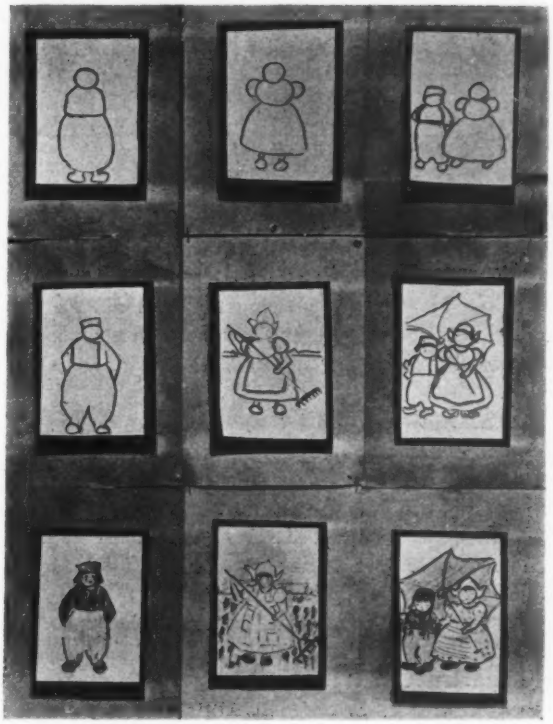
Drawing in this connection is used as English is used, merely as a tool or as a means of expression of ideas.

The accompanying illustrations which were worked out in the second grade in connection with a project on Dutch life, show that even in the case of very small children this power of expression can be developed without difficulty. The top row in each case shows the starting point, the second row the second step and the third row the completed picture. These pictures were drawn with colored crayons, and fairly intelligent and accurate observations on the part of the child were required in order to produce them.

It was necessary for the children to have some ideas concerning Dutch homes, costumes and customs before starting to draw. As the pictures developed, hazy ideas were replaced by definite, accurate, mental images and the details were then added to the pictures.

Drawing in this way proved to be of great value not only as an aid in forming ideas but also as a means of expressing and clarifying them.

The children's illustrations were finally used as a basis for their English work and formed a valuable part of the project which correlated many of the subjects of the curriculum.



DRAWINGS OF DUTCH CHILDREN.

CHILDREN'S DRAWING OF DUTCH HOMES AND ANIMALS.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

LET US GIVE THANKS.

Again the season of thanksgiving has come. We are reminded that our blessings should be carefully invoiced and that we should be thankful according to the balance in our favor. If we were fortunate enough to go to foreign countries last summer, as more American teachers did than in previous summers, we should have no difficulty in finding a balance of blessings in our favor.

The American teacher who goes abroad is twice blessed. Blessed in the privilege of going abroad, and blessed in the privilege of returning to America. If we were blessed with the privilege of a holiday summer at home we have much to be thankful for. If we spent the summer at hard work we received that satisfaction which hard work always brings.

In the way of somewhat better salaries and somewhat relieved school conditions, the American teacher is greatly blessed this year. Few occupations offer advantages this year over last year, but teaching, in America, is one of those few. The profession of teaching is on the mend. The teachers are also on the mend, and that is a double blessing; for teaching, like mercy, is twice blessed—"it blesseth him that gives and him that takes."

DEGENERATE ART.

We have before us a protest from a committee of citizens and supporters of the Metropolitan Museum, directed against the exhibition of "degenerate modernistic works" in the galleries of that splendid institution. We have not seen this exhibition but have been subjected to similar exhibitions elsewhere, and have observed these secession and modernistic movements in various expressions of degeneracy, a few of which seemed to us almost worth while.

The reasons for protest given by the committee are as follows: First, "The modernistic cults in the Arts are attempting to overthrow the present aesthetic system by the deification of ugliness." Second, "The modernistic cults in the Arts were organized by greedy dealers who seek to create a market for radical pictures by bidding them up at sales." Third, "Modernistic Art is a well-known form of insanity and the result of a disordered mind."

We are not greatly concerned about the first change because we consider the second and third as evident to normal individuals. To be sure, all cults and isms are directed to overthrow the established order of things. They rarely succeed in doing more than testing the established order and so expose its weaknesses and emphasize its strength.

In the case of ugliness versus beauty we are confident that beauty will win and ugliness will condemn itself. We are inclined to believe that enough ugliness will be presented to Americans without a deliberate exposition of it in the galleries, but if bad things need to be shown by way of comparison with the good, no institution can do this with greater safety than the Metropolitan Museum.

The charge most apt to prove disastrous to institutions is one of favoritism or class distinction. Democracy is quite as essential in the art of a people as in government. It is unfortunate to waste even a small part of the valuable facilities of the Metropolitan Museum with worthless collections, but who can say with certainty that an occasional exhibition of extreme types is worthless? We have great confidence in the judgment of those who have developed and maintained the Metropolitan Museum.

TEACHERS' ASSOCIATIONS AND THEIR PROGRAMS.

The teachers' association season has arrived. Without reflecting in any way upon the value and the importance of teachers' associations, it is nevertheless true that much valuable time and great expense are wasted in teachers' associations.

So many of the addresses heard at teachers' meetings are such vague generalizations as to be of but little, if any, assistance. Some of them are educational claptrap, that by courtesy has been called "inspirational."

Another pitiful and deplorable practice is the loading down of the special or sectional programs of state and district meetings, with speakers who are in no wise specialists in the fields represented by the audiences which they address. Many a round table or section meeting on industrial or vocational education has been ruined and the time wasted by speakers with only the most superficial knowledge of these special lines or by posers who profess an interest they do not feel or show.

The chief difficulty has lain in the fact that the funds have been used for the general programs and the sections have been compelled to use the same material.

The only solution for the problem as regards industrial and vocational education would seem to be, to get by some means, an effective representation on the executive boards or committees. The only way to do this is to have a large representation of people engaged in these special fields and the general meetings, and especially at the business meetings of the various associations.

More and more the specialists in art, industrial education, home economics, and vocational education must become identified with the general movements and the general work of the schools. It is doubtful if

this generation will see the general school administrators and teachers fundamentally interested and adequately informed concerning the various types of special work.

The teachers of the special subjects must, therefore, maintain strong organizations of their own special groups and perfect their work and at the same time participate fully, as suggested above, in the organizations and activities of the general school people.

THE PRODIGAL'S RETURN.

Reports from institutions and departments of industrial and vocational education indicate a much increased attendance, in spite of the depressed financial condition of the country. The indications are that teachers who were diverted for a time from the educational field on account of considerations of remuneration and experience are flocking back to the profession and are brushing up ready to render better service.

Welcome back, brethren! We can't offer you the fatted calf, but we'll help you into jobs. Your salaries will probably be larger than those you left when you made the change. For your information, it should be said that it still costs for a teacher to live, but thus far we have heard from no teachers who have decided to quit living on that account.

There is yet room for good teachers. We hope that no failures in the business and industrial world will simply land in the teaching profession in self-defense. It probably never has been true that some people teach because they can't do anything else. More than ever must it be true now that teachers enter the profession and remain in it because they have a liking and an aptitude for this kind of service.

There are opportunities now in the teaching business for ambitious men and women who desire to render an honorable and effective service and to reap satisfying rewards. There was never a time when we could more conscientiously commend teaching to high grade, forward looking young men and women than the present.

May the prodigals continue to return and may the appeal of the teaching profession become stronger and stronger to the highest types of young men and women in this country. It is a worthy profession and it deserves worthy people.

THE SCHOOLS AND THE UNEMPLOYED BOYS AND GIRLS.

Now is the time of all times to make it possible for the working boys and girls to go to school. Times are hard, money is difficult to get, and employment is scarce and uncertain. What can boys do who lose their jobs and fail to get others? Some of them are wise enough and farsighted enough to want to get into school to prepare for the days when prosperity returns, when business and industry open up, and when men go to work again.

The difficulty is that in an overwhelming number of instances there are not schools or classes available for these ambitious ones. In the average community, the high school does not and cannot meet the situation in its daily program and night schools have been discontinued for lack of funds.

Compulsory attendance and part-time schools would seem to offer the best, if not the only, solution to this problem. Dependence cannot be placed upon spasmodic efforts by local organizations and interested individuals. The pressing necessity demands a *system* of handling this problem and a state-wide and even nation-wide organization for this purpose.

It is a lamentable fact that as the stress grows more intense, the disposition on the part of some states and many local school systems is to suspend the operation of the only agency that offered any sort of relief—the part-time school.

The most short-sighted policy that could be adopted by any community is the one that abandons the part-time school or postpones its establishment simply because the matter has been left to the option of the local community.

The public school should become more and more a *conserving* force that operates to stabilize and clarify situations when unsettled conditions arise and disintegration sets in. Perhaps it is a tribute to the public schools to say that they are conservative. Sometimes they are too unresponsive. They certainly should not be too responsive to conditions and influences that hurt and mar; but they should respond at once to the demands of society in helping to meet a complicated and trying situation like the unemployment situation that now confronts them. They cannot furnish employment; but they can provide instruction and training that will fit boys and girls out of employment for better positions and greater service when business and industry revive.

Study, and study hard. But never let the thought enter your mind that study *alone* will lead you to the heights of usefulness and success—*Grover Cleveland.*

The state of a laborer's mind, more, even, than the state of his purse, determines his acts. Our technical schools are training the future brain workers and managers of industry. We may, therefore, well ask ourselves, at this time, if there is anything we can do beyond what we are now doing to train our students to understand more fundamentally and to meet more successfully the gravest of all their future responsibilities, the organization and management of men—a responsibility which they and we owe, not to industry alone, but to the whole economic, social and political stability of the nation.—*Dr. Ernest Fox Nichols,* president Massachusetts Institute of Technology.

If I must be an extremist, I prefer to be one who believes that in every oyster shell there is a pearl rather than be one who is quite convinced that every oyster in every shell is bad.—*Dreier.*

Shame on the man of cultivated taste who permits refinement to develop into a fastidiousness that unfits him for doing rough work of a workaday world.—*Roosevelt.*

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

WINTER CARE OF OUR NATIVE BIRDS — A FALL PROJECT

Leon H. Baxter

In order to successfully attract and hold our feathered friends during the winter, we must begin early to scatter hayseed, millet and table scraps near the house.

It is a good plan to begin quite a distance from the buildings and after the birds are seen to be feeding, gradually drop the food nearer the house, until finally they will fearlessly feed from the window sill.

In the early fall, suet and meat scraps will keep better tied to the shady side of the tree. Later on, during cooler weather, they should be attached to the sunny side.

The birds may seem to ignore the food offerings at first, but as other food material gets less plentiful, they will soon be seen feeding on the crumbs we have prepared for them.

Many birds which would seek a more plentiful food supply further south will not be attracted and held, and after once securing their attention and accustoming them to their human friends we must see their food supply does not fail. The following birds have been attracted and held during the winter by food shelves: Chickadees, nuthatches, wood-peckers, juncos and even the wary jay.

Feeders may be made from almost any material and may be very plain or artistically constructed and bark covered. Feeders are as interesting to make in the early fall as bird houses are in the spring. The photograph shows a group of prize winning feeders.

PRIZE WINNERS.

Corn, suet, meat scraps, crumbs from the table, pieces of doughnut, nuts, sunflower seed, frozen milk and many other food materials may be utilized if one wishes to experiment.

The birds will furnish excellent instruction and amusement to the household during the winter and a vast amount of good may be accomplished in this manner, adding greatly to the comfort and happiness of our wild bird friends.

Plate I

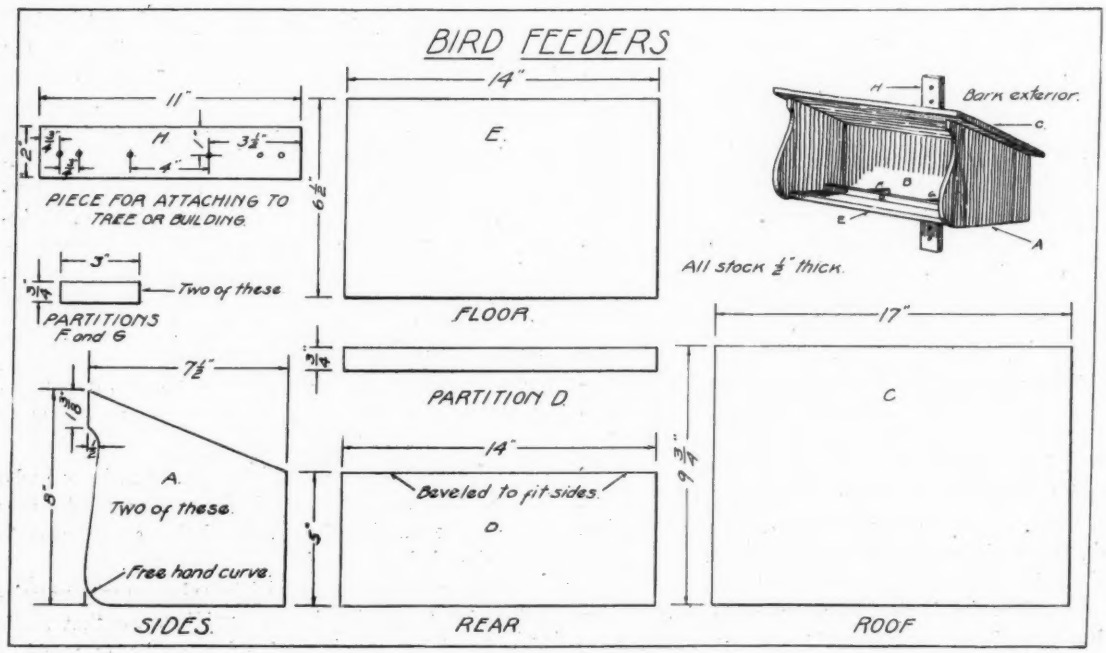


Plate 2

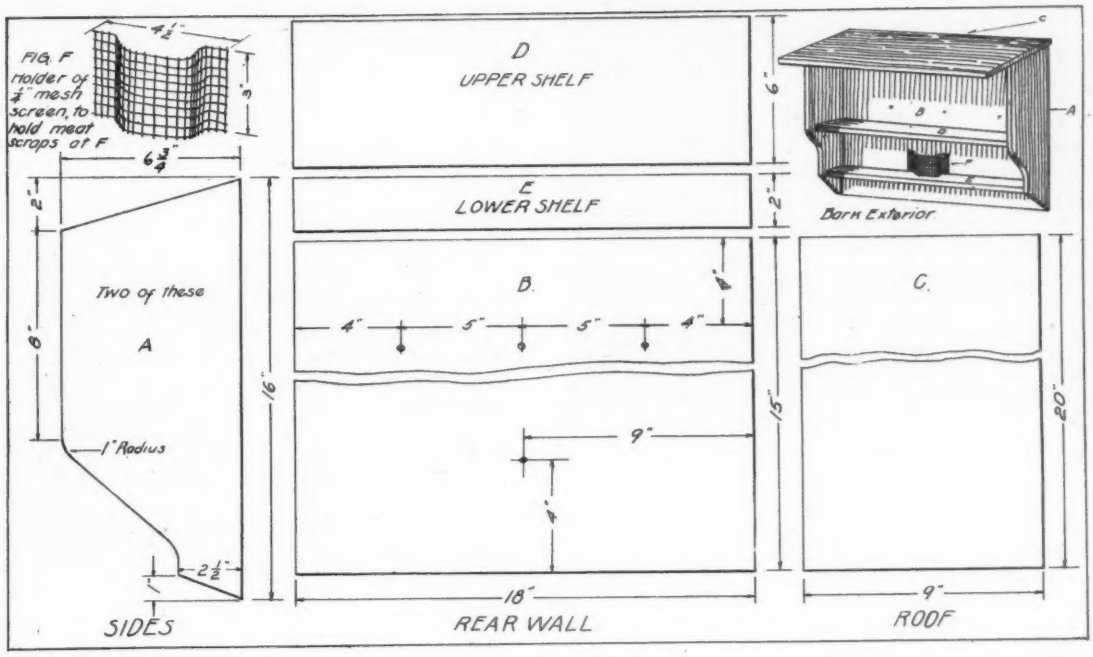
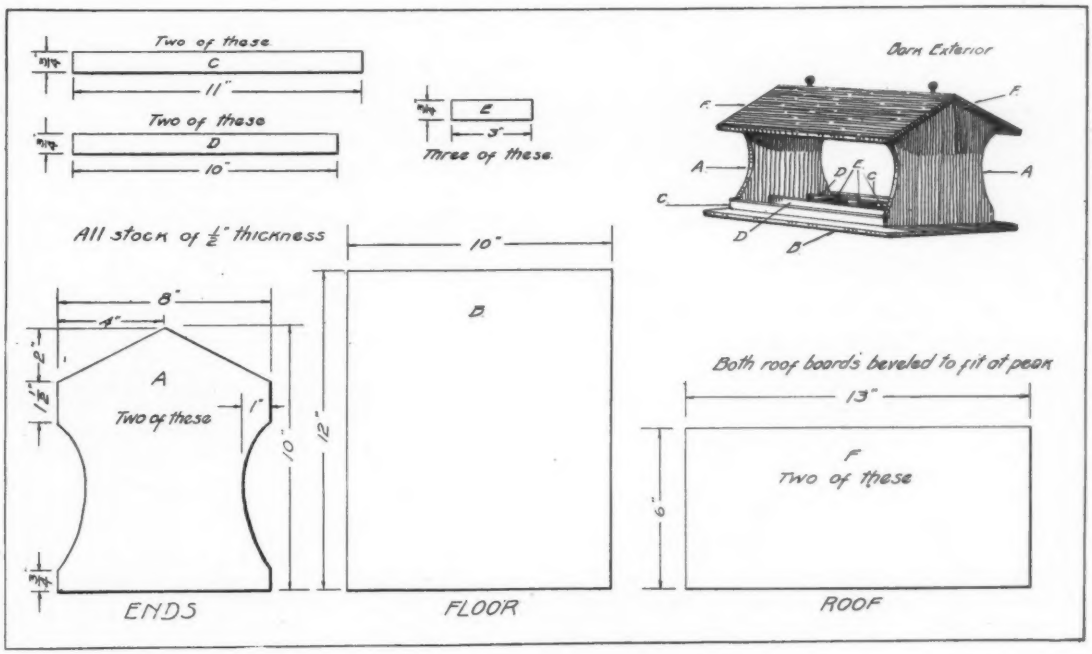


Plate 3

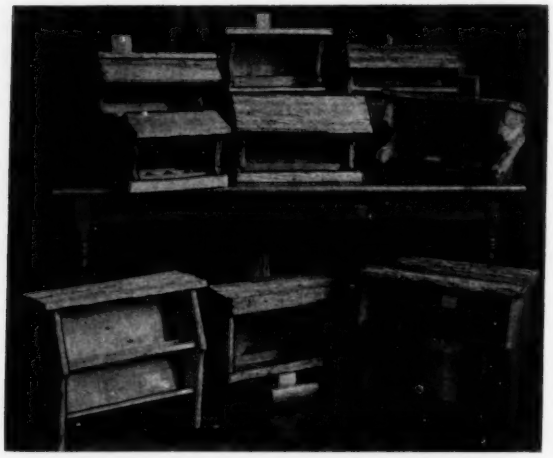


Consider the feeder you wish to make and after consulting the drawing and being sure every detail is clear to you, procure a half-inch board, of either spruce, cypress or soft pine, of a width that will allow you to get out the various pieces with as little waste as possible.

Illustration I shows a simple artistic feeder suitable to be attached to a tree or building. A board 10" wide will be found suitable for cutting out the pieces.

The two sides, A, should first be cut out in one piece 8"x15⅛" the extra eighth allowing for the saw cut when cut in two.

Plane one edge of the piece straight and smooth and call this working edge, or edge from which all measurements are to be taken. Square one and square with both the working edge and the surface. Measure from this square end the length called for, which is 15⅛", and square a line across the board, placing the try-square handle tight against the working edge.



BIRD FEEDERS MADE IN THE AUTHOR'S CLASSES.

With the cross-cut saw carefully saw just outside your line on the side away from the piece to be cut off. Now plane back to the line and no further. The width is next obtained, which is 8". Draw a line parallel to the working edge and 8" from it.

Saw just outside this line and then plane to it, taking care to get the edge square. Each piece in all of the plates is treated in this same manner.

The piece should now be exactly 8" wide by 15¼" long. Cut the piece carefully in two equal parts, each of which will be 8" wide by 7½" long. From one corner of the longer side measure 5" and draw a line to the opposite further corner, thus getting the pitch of the roof. Saw and plane carefully to this line. Measure down on the other long side 1⅜" as shown, and starting here draw a free-hand curve similar to the one on the drawing, seeing that the curve only cuts in ½". Cut this curve with either a turning saw or chisel and file smooth. Place the completed side on the unfinished piece and tracing around, finish in a similar manner.

The angular pieces from the sides can be used in cutting the partitions F and G.

The rear, B, the piece, H, and the partition, D, can next be cut from one piece of the board previously used, 14" long. Finish B, 5" by 14" piece H, 2" by 11" and partition, D, ¾" by 14". The floor E, is to be cut 6½" by 14". Roof, C, is finished 9¾" by 17".

Holes are bored in the piece H where shown, for attaching to back of feeder and to house or tree. In assembling partitions D, F, and G should be nailed together with inch brads first. The two sides of A are securely nailed to the floor, E, and rear, B, then nailed in place. Nail in partitions D, F, and G before attaching the roof, as it will be found easier to do that now. Attach roof in such a manner that the rear edge is flush with the rear wall and has equal projections over the sides.

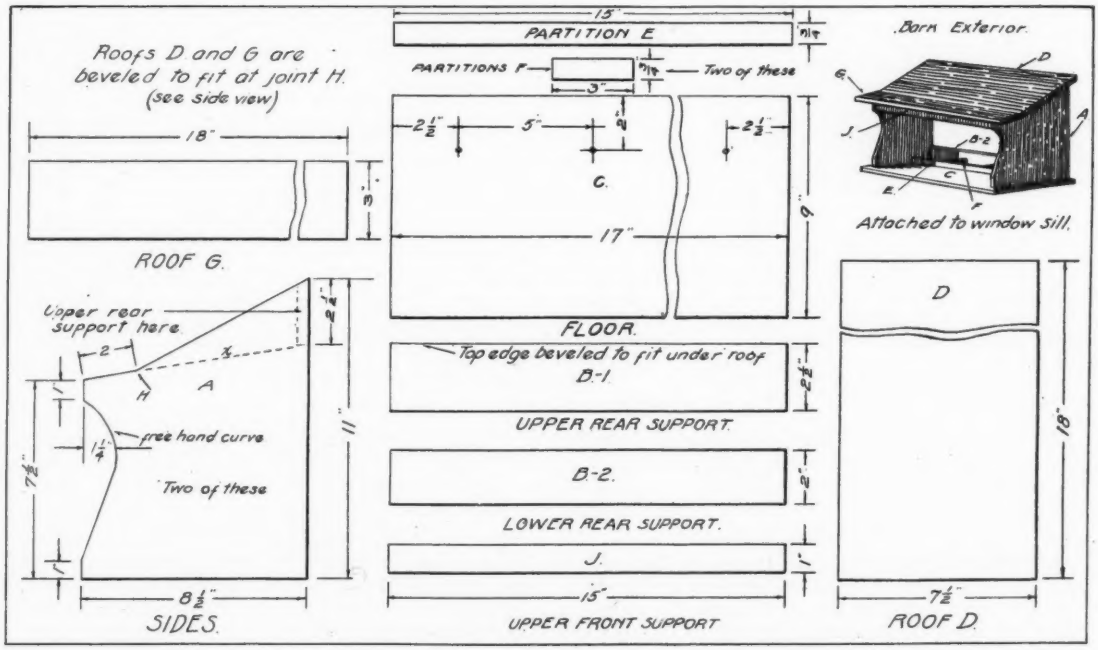
The last piece to be attached is piece H, which is held in place by 1" flat head screws. The interior should be stained brown, Johnson's No. 125 Mission Stain being very good. The exterior should be covered with cedar bark held in place by 4 oz. tacks, as shown in the group photo.

The remaining three illustrations can be read and the feeders made without any difficulty if a little careful thought is used and each piece is checked up before cutting.

Illustration II is a very successful feeder with two shelves, the lower one having a wire container for holding suet and meat scraps. This can be bent into shape in a vise or pounded over a block of wood. The upper shelf could be divided by partitions similar to those in Illustration I if desired.

The two sides, A, are the only two places that may give any trouble. They finish 6¾" wide and 16" long. Measure down on one side 2" and draw to opposite upper corner. Measure 8" beyond the 2"measurement. Next from lower long edge measure out 2½" and up 1" as indicated, and draw the sloping line. From this point, with a 1" radius, strike an arc and in a similar way from the 8" measurement do the same and draw the long sloping line.

Plate 4.



These may now easily be cut out, taking care that the two sides are exact duplicates.

Illustration III is a feeder designed to be attached to a wire or rope strung between a tree and house. One interesting feature of this type is that after the birds have started coming to it, it may be pulled a little nearer to the house each day, until the birds are feeding close to the window, where they can be easily observed.

The two ends are first cut 8″ wide by 10″ long. Locate the center of one end with a dot. Measure down each side 2″. Draw to center point for roof pitch. Measure from end of eaves 1½″ on each side. Measure up from bottom ¾″ as shown. From these points to points previously drawn, sketch a free hand curve, seeing that it does not cut in but one inch. The drawing shows clearly all of these dimensions.

Illustration IV gives the drawings and sketch of a feeder with the rear part open. This is so that it may be attached to a window sill and the birds observed from the interior of a room. After the birds are accustomed to it, the window may be raised slightly and crumbs held in the hand to entice some venturesome songster. The writer has found chickadees very tame, and in a short time they will fearlessly sit on the finger tips and feed on the crumbs.

The sides finish 8½″ wide by 11″ long. Measure up form one end 7½″ on the long way of board. Measure down from upper right hand corner 2½″. Draw from first measurement to this point a light line. Measure on this line 2″ as shown, and from this point, H, draw to upper right hand corner. This completes the double pitch of the roof.

From lower right hand corner measure up 1″ and sketch a free-hand curve to within 1″ of roof slope. See that the curve runs in only 1¼″. Cut out with turning saw and chisel and smooth up with a file.

The remaining pieces are easily cut to size.

MADE BY STUDENTS OF THE BAKERSFIELD HIGH SCHOOL.

DINING TABLE AND CHAIRS

K. W. Rich, Bakersfield, Calif.

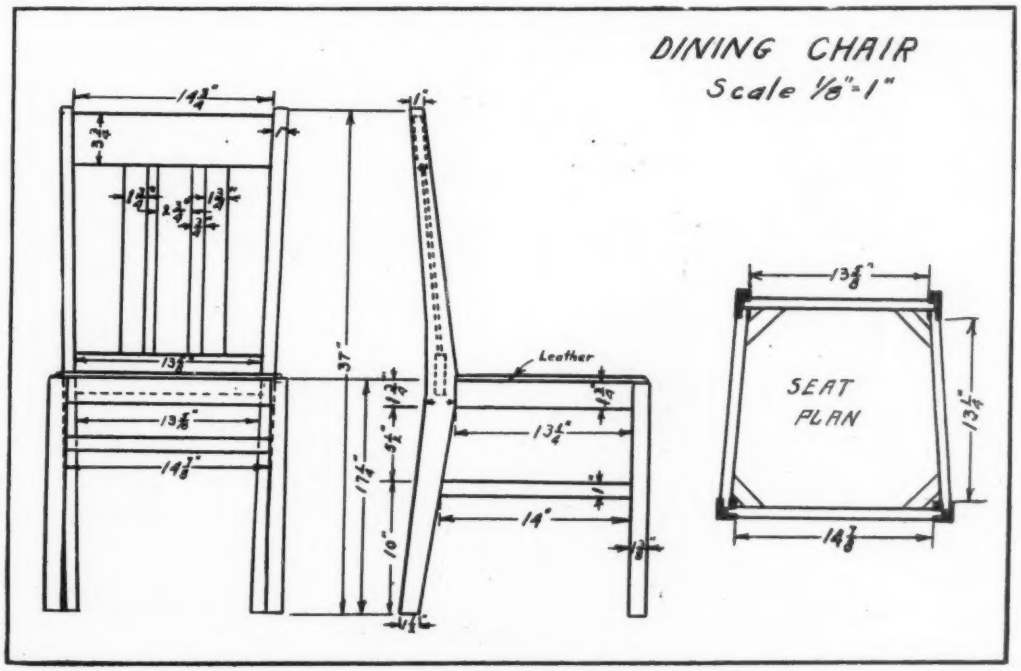
The dining table and chairs shown in the accompanying drawings and photograph have been quite popular with advanced students. One girl working alone, and doing most of her cutting work on the band saw, completed a table and six chairs last year.

For the chairs, a leather slip seat is preferable, though one or two have used shaped wooden seats. In the latter case the seat was slightly recessed on the lathe, then shaped with scrub plane, rounded scraper, and sandpaper. If spline or dowels are used to join pieces in seat, care should be taken to offset enough to prevent cutting through when shaping the saddle seat.

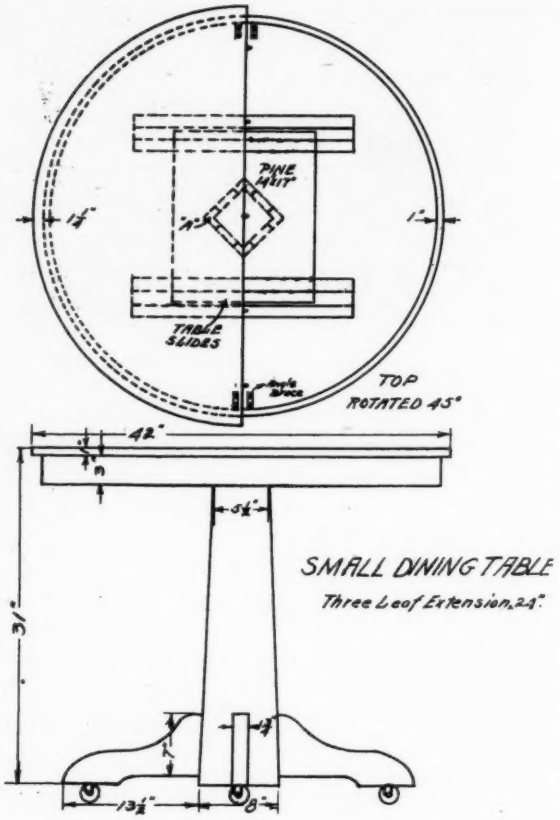
For leather slip seat the inner corner of the two front legs should be recessed enough so that the leather only will project above the top of the legs.

Braces, as shown in the seat plan, are always advisable.

A full-sized drawing should be carefully made of all three views shown. This drawing must be accurate, as the various angles are taken directly from it by means of the bevel square. All pieces must be cut to exact dimensions.



DETAILS OF CHAIR.



DETAILS OF TABLE.

We always find a tendency upon the part of our students to cut tenons too small, in a universal belief that glue will remedy any looseness if only plenty of it is administered. Where tenons are as short as is necessarily the case in most chair work, this would be disastrous.

A jig, made of a piece of scrap wood cut at the proper angle, with a notch at the end to prevent feeding in too far, and then clamped to the band or jig saw table, is the method used for cutting tenons on an angle when many of them of the same pattern are to be made.

Dining Table.

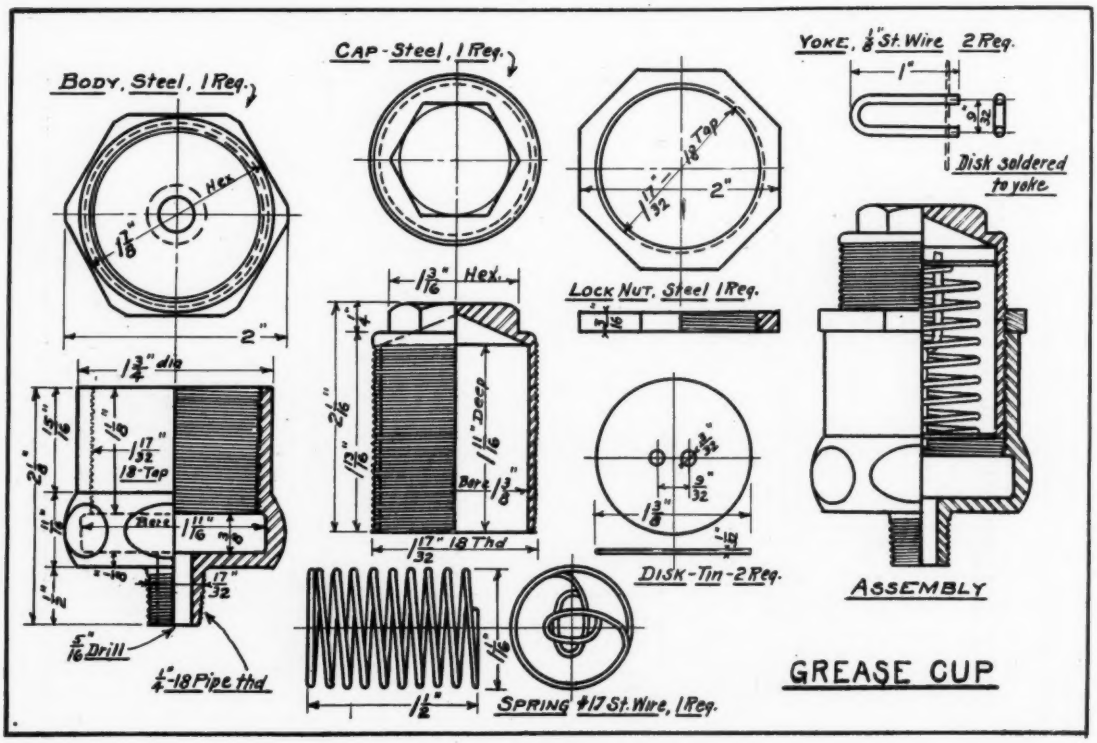
The table itself as here shown is a common commercial type of small extension table with solid pedestal. We have made larger tables of the same sort, but the divided pedestal type should be used for a top much larger in diameter.

An easy way to make a strong pedestal is to rip from the table leg stock a square section from one edge, and then utilize the remainder as one corner of the pedestal. See "A" in the top view of accompanying drawing. Between each of the four corners so prepared is dowelled a wedge shaped piece to bring the pedestal to the required dimensions.

The feet are cut from solid stock and fastened with lag screws, two to each foot, passing through the base of the pedestal.

The one by three inch rim is made by cutting segments of white pine about eight inches in length and ⅞" wide from ¾" stock. The template by means of which the stock is marked must be carefully laid out with regard to proper curvature and to angle at either end. When sufficient segments have been cut (forty or fifty will be needed) proceed to assemble with glue and handscrews, using an occasional nail to prevent slipping if necessary.

After glue is dry take two two by fours as long as the inside diameter of the rim and half lap them in the center,



DETAILS OF GREASE CUP.

the sticks forming diameters at right angles to each other. Nail the rim to the sticks using finish nails and setting them into the rim ¼". Screw to an outside face plate and dress to a true circle on the lathe. Fill all holes with plugs or saw dust and glue. Glue size the outside of the rim and set aside to dry.

Rip a piece of ⅛" or 3/16" sawn veneer about 3¼" wide and long enough to move then reach around the circumference of the rail. Glue this to the rail, keeping cove and veneer warm and using plenty of hand screws. It is a good plan to heat a thin strip of wood to bend between screws and veneer to act as a caul. Leave clamps on for several days, then dress up both sides with circular plane, etc. Weight the rim to a flat surface until ready to attach to table top. Screws set deeply into under side of rim are satisfactory fastenings. Do not cut the rim into sections until finally fastened in place.

Attach pedestal top to pine piece by screws through top of pine. The slides after being screwed to table top are also screwed to the pine.

Table slides are inexpensive and are not worth the trouble to make. If one is desirous of making slides and all, by all means secure an old slide and study its construction before attempting to fashion something upon which the satisfactory use of the table depends.

Angle braces on either side of either joint of the rail, as shown in the drawing, are advisable.

GREASE CUP.

Harold Diemer, Director of Vocational Education, Calumet, Mich.

This little problem is of value for the variety of operations it involves. The plate is self-explanatory.

A WINDOW VENTILATOR.

J. I. Sowers, Vincennes, Ind.

This window screen is made up of pine. The sizes vary, each pupil taking the measurements of his own window in which the screen is to be used. It will be noted that the screen has a ¾ inch adjustment, by means of the small slide at one end, this permits the screen to be put in position in the window and the slide extended to take up the necessary shortness of the screen, which must be made shorter than the space it is to occupy in length, in order to let it pass the window stops as it is being put in position.

The screen has a piece of coarse cloth tacked on the outside and held in position by narrow strips of moulding, as suggested in the isometric drawing. In use the screen prevents the danger of direct drafts of air and also keeps dirt, soot and cinders from the rooms. As a problem we find it very interesting, and useful. We are using it in our 8B grade work.

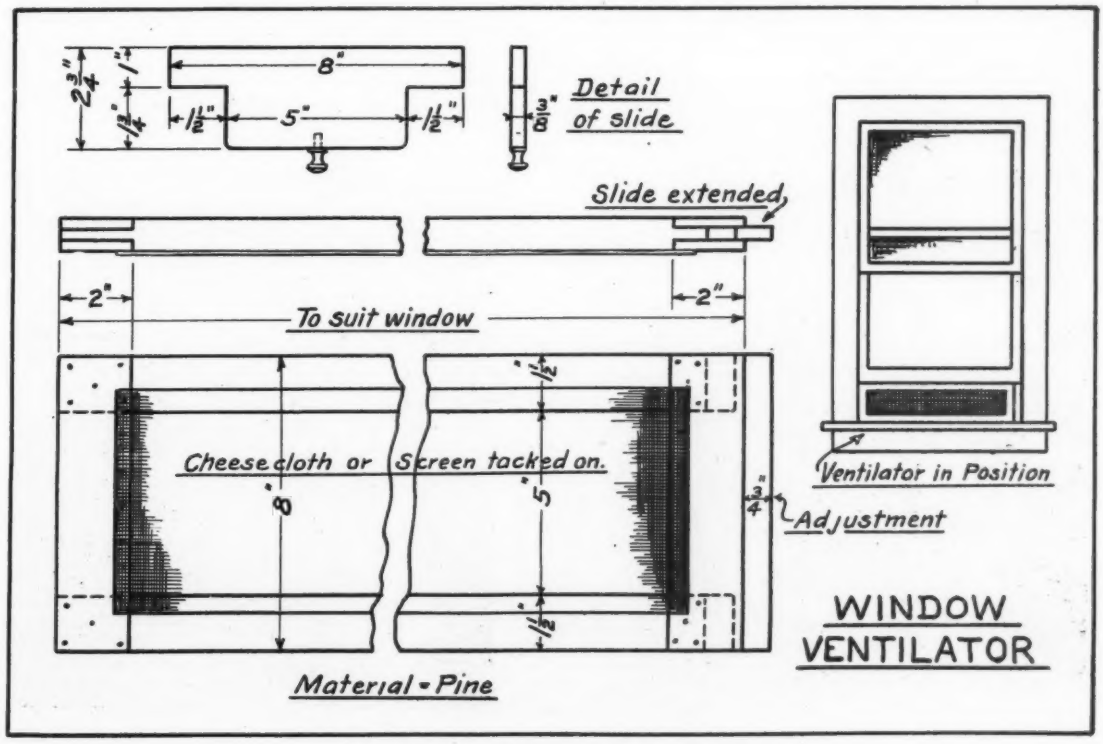
THE VALUE OF PRINTING IN PUBLIC SCHOOLS.

There is a physiological necessity on the part of the child for motor activity and the foremost educators of today insist that a considerable part of the school program should consist of activities. Printing provides for the schoolroom an activity of universal interest and high educational value.

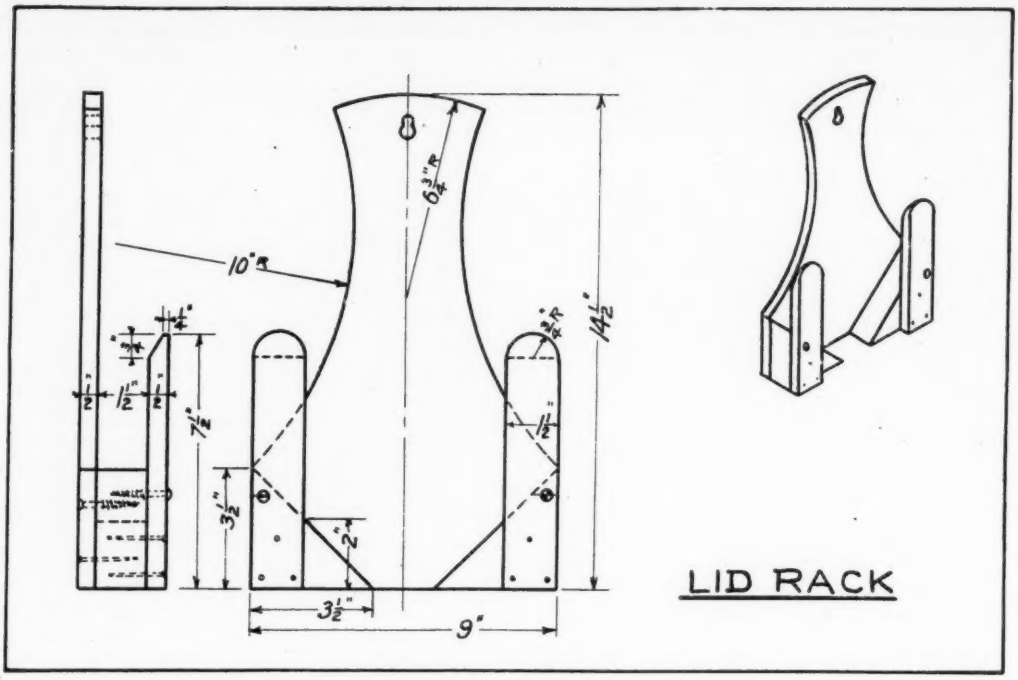
Printing vitalizes other school subjects by affording opportunity for the practical application of the information acquired in them in ways that appeal to children as worth while. This is especially true for reading, language, English and art.

Industrial intelligence should be an important objective of school work for children of the leading industrial nation in this preeminently industrial age. Through the printshop pupils secure a first-hand experience in the fifth industry of the country and learn its fundamental principles and processes.

In the matter of social significance printing is practically ideal. Almost every problem is a community project that a number of pupils combine their efforts to produce. Practically every task in the printshop is undertaken with the consciousness of real service to a great number of



DETAILS OF SCREENED WINDOW VENTILATOR.



DETAILS OF LID RACK.

people in the school or in the community at large. The home-printed school paper has almost unlimited possibilities in social values.

There is just as great need of education for intelligent consumption as there is for efficient production. After food, clothing and shelter, printed matter ranks as the next most important item utilized in the civilized world today. Adequate appreciation of the product of an art can only be acquired through creative effort in that art.

The knowledge and experience obtained from a school course in printing is of considerable value, not only to the many who enter some one of the many occupations of the printing trades, and to those who become editors, authors and publishers but also to the much greater number who enter occupations which have much to do with printing in the way of advertising, issuing catalogs, and other publicity work.—Peabody Reflector, Peabody College for Teachers, Nashville, Tenn.

A LID RACK.

W. W. White, Waterloo, Ia.

This problem is entirely new in the Waterloo schools and has proven of great interest. Formerly the tin and granite covers of the kitchen rested in a wire frame from the ten cent store, or worse, they were stored behind the pots and pans in the pantry cabinet. This staunch little rack made of any soft wood and painted or shellaced and varnished, will put the wire holder to shame. The problem is excellent for the 6A or 7B grade.

MANUAL TRAINING EXHIBIT, PUBLIC SCHOOLS, RUMFORD, ME.

VOCATIONAL TEACHERS' SELF-ANALYSIS CHART

"A set of questions for testing your efficiency."

1. Have you a well-arranged Course of Study on file for ready reference? Do you refer to it, modify it, add to it from time to time? What is your contribution to the cause of vocational education in this respect?

2. Are you a factor and a force in your trade union? Do you champion the vocational school movement whenever possible?

3. Do you attend vocational meetings and conventions whenever possible? Are you a "live" member of school associations and clubs.

4. Is your room or shop a model of orderly arrangement, system and neatness? Are you making the best showing possible under your present conditions?

5. Are you a vital factor in the vocational movement outside of your schoolroom? Do you contribute to vocational and educational journals the good results of your teaching experiences?

6. Are you keeping abreast with the times in your own trade line? Do you visit commercial shops regularly? Are you known to the important men in your trade?

7. "I can imagine no better form of education for a boy than a friendship of his own choosing with a schoolmaster whom he respects and likes."—C. A. Alington, Headmaster, Shrewsbury School, England.

To what extent are you a "Big Brother" to your boys? Do you establish a personal touch with each of your pupils?

8. Shop Teachers:—Aside from teaching trade processes and operations, are you training your boys in the right mental attitudes toward their work?

9. Have you constantly in mind your mission in "general character training" as well as the teaching of your specific subjects?

10. Do you find joy in your service as a teacher? Are you "large of vision," ever learning, willing to try something new and better, and anxious for self-improvement?

11. Have you a broad conception of education as a whole,—or do you mistake your particular "segment of the educational circle for the entire circle?"

12. Are you an example of the best things in efficiency and scientific management?

Do you administer your shop wisely?

Are the city's tools and machines properly taken care of?

Have you an efficient toolroom and stock-keeping system?

Are many things lost or stolen from your room because of lack of proper checking each day?

Do you keep your plant in good repair?

13. Are your personal habits of speech, dress, etc., such as to inspire boys to higher things?

14. Do you co-operate with your principal and director in carrying out suggestions with promptness and dispatch?

The army of the disabled keeps growing
1919-3,300
1920-17,500
1921-26,300
1922-?
Under Government care
The Red Cross is spending Ten Million Dollars a Year to help the ex-service man and his family —
Annual Roll Call · Nov. 11-24, 1921

THE RED CROSS MAKES ITS ANNUAL APPEAL.

15. Do you systematically plan your shopwork lessons? Your bookwork lessons? Does every boy get a "square deal"? Have you a systematic scheme of keeping track of a student's work, progress and accomplishment? Does every pupil get an "all-round training?" Do you allow favorites to monopolize your time?

16. Are you doing your share in assisting in outside-of-school activities; such as, clubs, athletics, school paper, orchestra, etc.?

17. Do you assist your backward pupils in making up time and work after school? Do you ever suggest to boys your willingness to render special after-school assistance?

18. How do you spend your vacant class periods? Have you a regular plan of visiting shops and discovering material for related bookwork?

19. Do you get along well with your lads? To what extent do you find it necessary to rely on office assistance in cases of discipline?

20. Are you a factor in helping to build up the morale in the school in which you are teaching?

21. Are you working toward "Economy of Time" in the teaching of your subject?

—Wm. B. Kamprath, Principal, Elm Vocational School, Buffalo, N. Y.

A FEW ARTICLES PRODUCED IN THE FORT DODGE, IA., SCHOOLS. MR. E. T. SNIVELY, DIRECTOR, MR. GEORGE TRUE, ASSISTANT.

A FEW ARTICLES MADE BY FRESHMEN AND SOPHOMORES IN THE MT. VERNON, WASH., HIGH SCHOOL. W. W. NOLIN, DIRECTOR.

NEW BOOKS

Industrial Mathematics Practically Applied.

By Paul V. Farnsworth. Cloth, octavo, 272 pages. D. Van Nostrand Co., New York.

This book covers the entire range of practical mathemathics as applied to the metal working occupations. It is, as the author indicates in his preface, the result of twelve years of experience in teaching students in trade courses. The book reviews in less than fifty pages, the entire range of arithmetic and then takes up the elements of algebra and trigonometry. From this point on, it plunges into the applied mathematics of the shop without further consideration for a logical development of higher mathematical principles. The treatment follows the usual arrangement of topics in mechanics and proceeds from the simplest motions and force to the most complicated cam design. Each topic is introduced by means of definitions and descriptions and the mathematical elements are reduced to formulae with the standard engineering nomenclature. The problems are taken almost entirely from actual shop experience, with a very few examples of "boy interest."

The book appeals to us as the most thorough and teachable which has been offered for vocational classes in technical high schools and trade schools. It is especially satisfactory in its approach and in the insistence upon methods which are standard in the drafting room and the shop.

Drawing Room Practice.

By Frank A. Stanley. Cloth, 253 pages, illustrated. McGraw-Hill Book Co., New York, N. Y.

This work is a handbook for the young draftsman who desires to have at hand a statement of the theory and best practice of drawing as applied to the mechanical industries. The work is both text and reference book and statements, definitions and illustrations, while complete and detailed, are intended for the more mature mind rather than the novice. The book opens with a description of drawing instruments and leads the reader through all the principles of projection, development of surfaces, assembly and working drawings, etc., etc., to shop sketching. Of considerable value are chapters on tool drawings, limit and tolerance dimensions for quantity production, and working drawings of small and medium size mechanical parts.

The author has a fresh, clean cut style of presenting facts and discussing methods. He uses numerous photographs of castings and machine parts to make doubly clear the ideas he is driving home. The result is that the book is attractive and interesting and is a vast improvement over the usual dry-as-dust text on mechanical drawing.

The Welding Encyclopedia.

Compiled by L. B. Mackenzie and H. S. Card. Cloth, 326 pages. Price $5.00. The Welding Engineer Publishing Company, Chicago, Ill.

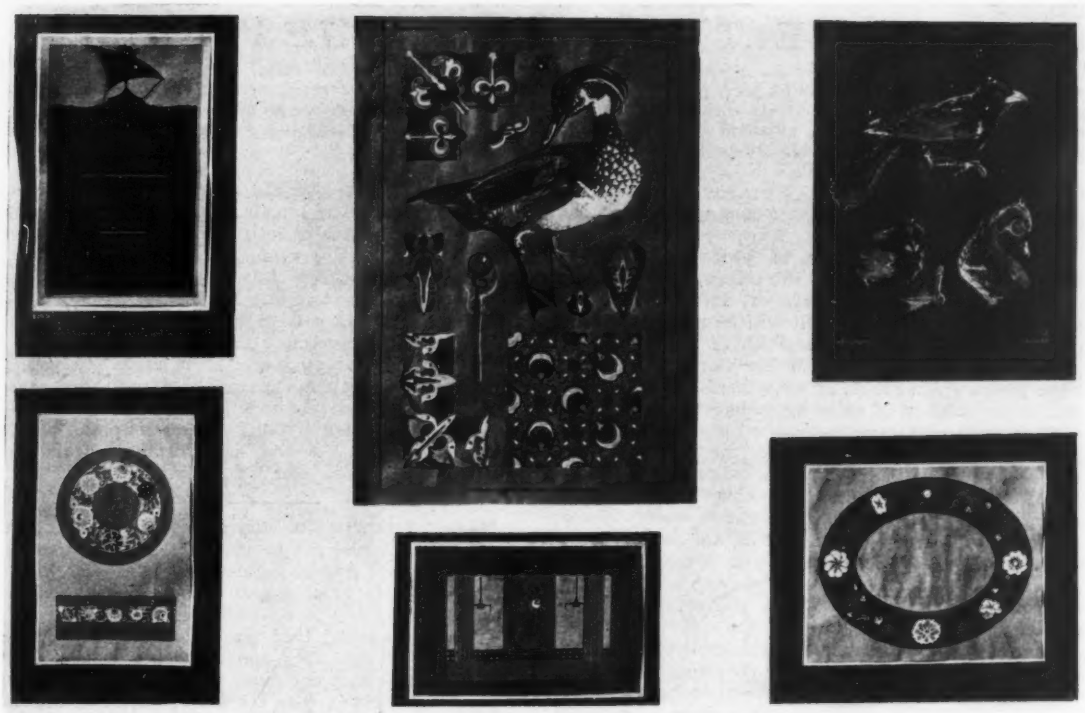
This book presents in alphabetical order the latest theoretical and practical information on autogenous welding by the several present day processes. The authors and editors of the book have had an unusual opportunity for gathering material because of their intimate connection with the field and their broad study of conditions. The book is fully illustrated and contains in addition to the general information on the subject much special information on specific problems and difficulties in welding. Special chapters are devoted to rules and regulations of the government and of associations, such as the Department of Commerce, Interstate Commerce Commission, the American Railway Association, the Underwriters Laboratories, the Board of Fire Underwriters, etc. Special tables on temperature, properties of metals, are included.

PUBLICATIONS.

Basket Willow Culture. By George N. Lamb, scientific assistant, Forest Service of the United States. Farmers' Bulletin 622, 1914, of the Department of Agriculture, Washington. The bulletin discusses the different varieties of basket willows and methods of willow growing which have been found most satisfactory as a result of experiments conducted at the Forest Service Willow Farm at Arlington, Va. It is of special interest to those engaged in, or contemplating basket-willow culture, and is applicable to all portions of the country where willows are grown.

Vocational Teachers' Review, summer session, 1921. State Normal and Training School, Oswego, N. Y. The summer session is conducted for teachers in industrial,

TABLE MADE BY A STUDENT OF THE MT. VERNON, WASH., HIGH SCHOOL.



NATURE AND DESIGN STUDIES BY DR. JAMES P. HANEY'S STUDENTS.
The above illustrations show the steps taken, in the New York University summer school, last July, to lead students to develop original motifs from the study of nature. Birds, flowers and other objects are searched for interesting motifs, and these are then applied to designs for many materials.

BATIK DESIGNS FROM DR. HANEY'S CLASSES.
Several scores of interesting batik designs were made in the art department of the New York University summer school, last July. The above illustrations show eight of these patterns for shawls. Several of the students developed their patterns on silk after having completed the designs in tempera.

part-time and foreman training classes and also teachers of trade work in unit trade schools, general industrial schools and evening vocational schools. The courses are planned so that teachers may strengthen their work in technique or on the professional side. Among the courses offered the past summer were electricity, elementary and advanced printing, woodworking, machine shop practice, sheet metal work, automobile mechanics, education and methods.

The Manhattan evening trade school, New York City, has introduced two new courses in interior decoration. The first is planned for those who desire to follow interior decoration as a profession. The second is a simple course including periods of art, furniture, upholstering, textiles, drapes, hangings, paintings, electrical appliances, color harmony in the home.

William H. Dooley has been chosen principal of the Textile High School of New York City. He had been acting principal since the opening of the school last year.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Mahogany Finish on Poplar.

233. Q:—How would you put a mahogany finish on poplar wood?—B. C.

A. The method necessary to produce mahogany finish on poplar will depend upon two things, i. e., whether a brown or red mahogany is desired. In case a brown or red mahogany is to be used, it will be necessary first to sponge the wood with a hot solution of two ounces of tannic acid crystals per gallon of hot water. This will raise the grain, which should be sanded smooth when dry. Prepare a hot solution of color by boiling two ounces of Bismark-brown analine, in one gallon of ordinary vinegar. Contrary to the nomenclature of the dye employed, this solution will produce a bright red shade which in contact with the sponging solution of tannic acid will produce a rich mahogany shade after eight to twelve hours in contact with the carbon dioxide of the atmosphere. If a still browner shade is necessary it is advantageous to mordant or set the color through the use of a further solution of two ounces of potassium dichromate crystals to a gallon of hot water.

Poplar is lacking the characteristic essentials of oak and birch, for instance, necessary to produce good shades of color; but through the use of the above stock solutions any shade of red or brown may be produced according to the method outlined. A straight red color, of course, can be produced through the acid solution of Bismark brown and vinegar alone; although the red shades are quite passé having been superseded by the richer and deeper toned shades of brown over red. After the stain coat has dried at least twelve hours give a very thin wash coat made from shellac reduced one-half with alcohol and tinted very slightly with Bismark brown. This tinting of the shellac seems to be necessary in order to overcome the grayish effect of the shellac under the varnish coat, which occurs when the tinting color is omitted. When the shellac coat is dry and hard it should be sanded down with a split 0000 or 00000 paper and cleaned up glass smooth. Dust off and varnish carefully. Dry three days or more and repeat the varnish coats until the desired depth of the finish is obtained. The last two coats should be rubbed with FF pumice stone, felt pad and water and cleaned up with a good oil polish. It is not necessary to fill poplar because of the entire lack of porosity.—Ralph G. Waring.

Texts on Reed Furniture Weaving.

235. Q:—I am contemplating having quite a little reed work done in my shop this coming year and am looking for information along this line. Can you refer me to any good texts on reed furniture weaving?—G. M. H.

A:—The following books will be found helpful in work of this kind:

"Worst's Problems in Woodwork in Combination with Other Materials," $2.50, Bruce Publishing Company; "Worst's Industrial Problems for the Middle Grades," $3.50, Bruce; "Perry's Seat Weaving," $1.25, Manual Arts Press, Peoria, Ill.

Varnish Trouble.

238. Q:—What is the trouble when varnish, applied to a table top for instance, will not dry and become hard but remains sticky.

How can I remove enamel from a high polish mahogany piano which was caused by rubbing against it in moving by another piece. There is just a very little bit about an inch on the front leg. Can it be removed without injuring the finish?—H. E. P.

A: It sometimes happens that unsuitable materials in the filler coat will prevent the proper hardening of the varnish; again some foreign material as a mineral oil occasionally finds its way into a varnish through accident and thereby causes it to remain sticky. The only recourse in a case of this kind is to entirely remove the finish, build it up properly and apply a very hard tough varnish, suited to this type of work, from a fresh paint can. Old varnish in a partly emptied can quite frequently assumes a condition which prevents it from drying properly.

The best way to remove the enamel from the leg of the mahogany piano case would be to use a felt pad, FF pumice stone, flour and rub carefully until the enamel spot is removed. The pumice stone should then be cleaned off and the whole face of the leg cleaned up and polished with rotten stone and a clean pad. Let dry off and clean up with a good polish.—Ralph G. Waring.

Manual Arts Attracts Students. The manual arts department, at Excelsior Springs, Mo., has experienced a rather remarkable growth in enrollment this year which is attributed largely to a radical change in shop teaching methods.

It became evident that the school shops would have to be closed unless they could produce articles which would prove the practical value of the work. As a result, the beginning classes, with the aid of the older students, began the construction of lumber racks for the tool room, lockers for the gymnasium dressing rooms, cabinets for the science laboratories and desks for the cafeteria, also swings and bicycle racks. The eighth grade has begun the construction of filing cabinets and drawing tables for the drawing classes.

The advanced classes are studying design and making period furniture, with special attention to the application of new finishes.

It is estimated the work of the manual arts students has saved the school board several hundred dollars, as well as saving the community money through the application of certain phases of home mechanics work. Mr. V. L. Pickens is director of the manual arts work at Excelsior Springs.

Machine Shop Work Added. A course in machine shop practice has been added this year at Washington, Pa. The equipment for the work was obtained last year from the Government and includes lathes, milling machine, and drill presses.

A second course in automobile construction has also been introduced. The class is at present working on a Ford engine, grinding valves and scraping bearings. The work covers four 80-minute periods each week.

A new feature has been added in the Continuation School. The noon day lunch is prepared by the girl students as part of the regular work. The lunch costs from twelve to fifteen cents per student. The school is in session eight hours every Thursday, with four hours given to academic subjects and four to shop practice. Mr. Geo. C. Donson is supervisor of manual arts work at the high school.

New Trade School Course. A practical course in sign painting, show card writing and commercial arts work is offered this year at the evening trade school, Brooklyn, N. Y. Instruction and material are free to students.

The entire September, 1921, issue of the Buffalo School Magazine was devoted to the work of the vocational schools. Special articles on vocational guidance by Mr. E. T. Welch, on the rehabilitation of soldiers by Mr. A. H. Bingham, on high sports of the schools' work by Mr. W. B. Kamprath, on the part-time schools by Mr. Wm. J. Regan and a dozen others are included. The issue is illustrated with photographs of classes at work, problems, etc.

A LIST OF LUMBER DEALERS WHO ARE WILLING TO SUPPLY MATERIALS TO MANUAL ARTS AND ENGINEERING SHOPS.

Compiled by Victor J. Smith, Professor of Manual Arts, State Normal School, Alpine, Tex.

(Concluded from October.)

Many instructors in our schools and colleges have experienced difficulty in securing the variety of hardwood lumber necessary to properly conduct classes in woodworking. Local yards are rarely able to solve the problem either in variety of woods or price. The following list of firms has, therefore, been compiled in order to enable such schools to get in touch with the larger lumber dealers in their neighborhood.

Each firm is listed by special permission and the general tone of the letters received in answer to our inquiry was one of friendliness to the school shop and a more than commercial interest in manual arts and engineering woodworking.

The following list of varieties will enable one to identify the stock for sale by any given firm listed. The second part of the list of varieties is only sold by a few companies.

1. Ash.
2. Birch.
3. Basswood.
4. Beech.
5. Cedar.
6. Chestnut.
7. Cherry.
8. Cottonwood.
9. Elm.
10. Cypress.
11. Plain red gum.
12. Quar. red gum.
13. Plain sap gum.
14. Quar. sap gum.
15. Hickory.
16. Locust.
17. Mahogany.
18. Maple.
19. Magnolia.
20. Plain red oak.
21. Quar. red oak.
22. Plain white oak.
23. Quar. white oak.
24. Persimmon.
25. Pecan.
26. Poplar.
27. Pine (white).
28. Redwood.
29. Sycamore.
30. Tupelo (black gum).
31. Walnut.
32. Willow.
33. Bay.
34. Box elder.
35. Buckeye.
36. Butternut.
37. Hackberry.
38. Hemlock.
39. Laurel.
40. Norway pine.
41. Sassafras.
42. Spruce.
43. Tamarack.
44. Tropical woods.

Memphis—F. T. Dooley Lumber Co.—1, 4, 5, 9, 10, 11, 12, 13, 14, 15, 18, 20, 21, 22, 23, 26, 29, 30. Scattered Mills.

Memphis—Geo. C. Brown & Co.—1, 5, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 25, 30. Greensboro, N. C.; Crooked Bayou & Proctor, Ark.

Memphis—Goodlander-Robertson Co.—1, 5, 9, 11, 12, 13, 14, 20, 22, 23, 26.

Memphis—Grismore-Hyman Co.—1, 9, 10, 11, 12, 13, 18, 20, 21, 22, 23, 24, 25, 29, 30 and 31. Pekin, Ark.

Memphis—Jas. E. Stark & Co.—1, 5, 9, 10, 15, 17, 18, 19, 20, 21, 22, 23, 25, 29, 30, 31 and 32.

Memphis—J. H. Bonner & Sons—9, 11, 12, 13, 14, 18, 20, 21, 22 and 23. Jonquil, Ark.

Memphis—L. D. Murelle—1, 3, 7, 13, 14, 18, 19, 20, 21, 22, 23, 26.

Memphis—Mossman Lumber Co.—1, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 26, 29, 31.

Memphis—Philip A. Ryan Lumber Co.—1, 9, 11, 12, 13, 14, 20, 22, 23 and 30. Lufkin, Texas.

Memphis—Rush Lumber Co.—1, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 25, 26, 29, 31. Hackberry, plain and quar. black gum.

Memphis—Stimson Veneer & Lumber Co.—1, 3, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31 and 32. Helena, Ark.; Huntington, Ind.

Memphis—Tallahatchie Lumber Co.—1, 4, 9, 10, 11, 12, 13, 14, 15, 18, 20, 21, 22, 23, 25, 26 and 30.

Memphis—Welsh Lumber Co.—1, 4, 5, 9, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23, 26.

Memphis—See Maley & Wertz Lumber Co., Evansville, Ind.

Memphis—See G. W. Jones Lumber Co., Appleton, Wis.

Murfreesboro—Earthman Lumber Co.—1, 5, 7, 6, 15, 26, 31 and oak.

Texas.

Austin—Nalle & Co.—2, 10, 20, 21, 22, 23, 27 and pine. Panel and made to order parts. (S)

Beaumont—Beaumont Lumber Co.—10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 25, 30 and pine. Carloads only.

Beaumont—Keith Lumber Co.—10, 11, 13, 19, 20, 22, 30 and pine. Voth & Rockland, Tex.

De Kalb—De Kalb Tie & Lumber Co.—11, 13, 20, 22.

Deweyville—See Peavy-Byrnes Lumber Co., Shreveport, La.

Ewing—H. G. Bohlssen Mfg. Co.—1, 3, 4, 19, red and sap gum and red and white oak.

Grayburg—William Graydom Hardwood Co.—1, 10, 11, 13, 20 and 22.

Houston—Robertson-McDonald Lumber Co.—1, 9, 13, 19, 20, 21, 22, 23, 30, mulberry and pine. Duers, Texas.

Lufkin—See Philip A. Ryan Lumber Co., Memphis, Tenn.

Lufkin—Martin Wagon Co.—1, 11, 13, 15, 20, 22.

Mt. Pleasant—Walton Lumber & Tie Co.—1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 25, 26, 27, 29, 31 and 32. Carloads.

New Willard—King Creek Lumber Co.—1, 3, 4, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 29, 32.

Paris—L. N. Kimer Lumber Co.—1, 3, 9, 11, 12, 13, 14, 20, 25, 29 and 31.

Texarkana—Southern Pine Lumber Co.—1, 9, 10, 11, 12, 13, 14, 15, 19, 20, 21, 22, 23 and pine. Dibell, Texas.

Wisconsin.

Antigo—Mattefs Bros. Co.—1, 2, 3, 5, 7, 9, 18, 20, 21, 22, 23, 26 and 27. Cabinets and special parts to order.

Appleton—G. W. Jones Lumber Co.—1, 2, 3, 11, 12, 13, 14, 15, 18, 20, 21 and 22. Wabeno, Wis.; Tendall, La.; Wausau, Wis.; Memphis, Tenn.

Marinette—Sawyer Goodman Co.—1, 2, 3, 4, 5, 9, 20, 27, hard and soft maple, 36, 38, 40, 42, 43, rock elm, tamarack, Norway pine and spruce, Goodman, Wis.; Sagole, Mich.

Milwaukee—Geo. W. Waetjen & Co.—Hardwoods and panels.

Milwaukee—John Schroeder Lumber Co., foot of Walnut St.—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 18, 20, 22, 26, 27, 31, 38, 40, 42, 43.

Rhinelander—Masey-Donalson Lumber Co.—Basswood and birch. Carloads.

Wausau—B. Heinemann Lumber Co.—1, 2, 3, 9, 18, 27.

Illinois.

Chicago—John S. Benedict Lumber Co., 419 North Halstead St., 1, 18, 20, 22, 23, 26, 27, 31, 38, 42.

VENEERS AND LUMBER SPECIALTIES.

Companies marked (S) on the long list refer to these firms.

Illinois.

Chicago—Veneer Manufacturers Company—veneers in gum, birch, poplar, oak, pine, spruce, mahogany, walnut, Vermillion and prima vera.

Pekin—Langton Lumber Company—walnut veneer.

Rockford—Litton Veneer Company—plain and figured veneers.

Indiana.

Ft. Wayne—Hoffman Brothers Company—veneers.

Indianapolis—Hoosier Veneer Company—foreign and domestic veneers.

Kentucky.

Louisville — The Mengel Company — African, South American and other tropical woods.

Michigan.

Grand Rapids—Walter Clark Veneer Company—veneers in birch, oak, pine, gum, mahogany and maple. Panels and drawer bottoms.

Grand Rapids—Grand Rapids Dowel Works—dowels, wood novelties and made to order parts.

Missouri.

Kansas City — Empire Veneer Company — mahogany and figured walnut veneers.

Kansas City—Western Veneer & Panel Company — veneers and panels.

St. Louis—St. Louis Basket & Box Company—panels and built up stock in mahogany and domestic woods.

Ohio.

Cincinnati—Ohio Veneer Company—veneers in walnut, mahogany, maple, birch, oak and rosewood. Plain and figured stock. Foreign woods.

Tennessee.

Memphis—James E. Stark & Company—veneers in gum and plain and quartered oak.

Memphis — Stimson Veneer & Lumber Company — veneers.

Texas.

Austin—Nalle & Company—veneers. Made to order stock.

Wisconsin.

Milwaukee—Geo. W. Waetjen & Company—veneers in gum, pine, oak and birch. Panels in stock and made to order.

LIST OF LUMBER DEALERS—GRATIS.

The INDUSTRIAL-ARTS MAGAZINE has just published in pamphlet form the preceding list.

Copies will be sent gratis to any reader and to any manual training instructor who will address the Subscribers' Free Service Department, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

WILL MEET IN MILWAUKEE.

The Vocational Education Association of the Middle West will meet in Milwaukee on January 11, 12, 13, 14, 1922. Up to last year this association had always held its meetings in Chicago. There was a belief that because of its central location it would not be practicable to meet at other remote sections of the territory represented. Last year however, the association ventured abroad. The meeting was held in Minneapolis—on the remote northern edge of the Middle West territory. The sessions were crowded to capacity, delegates were present from every nook and corner of the section, enthusiasm ran high and the net result showed a gain rather than a loss. The membership at the close of the Minneapolis meeting was greater than at the close of the previous meeting in Chicago, even though the latter was a joint meeting with the National Society for Vocational Education. Any doubts as to the place of this association in the hearts of the advocates of vocational education were dispelled. The convention is not a mere "pleasure jaunt" or a mid-winter vacation. It is rather a four-day post-graduate extension course for students of vocational education. Superintendents and directors of vocational education recognize this value and send members of their teaching staff as delegates, with expenses paid, believing that the value to their schools is more than equal to the expense incurred.

The convention of the association contains in its program, in additon to the "inspirational addresses" valuable results of long and careful study by committees which have been at work during the year. These reports are discussed and results are published in monograph form. "Monograph No. 1, series 1921" has just been announced by the publication committee. This deals with a report of the "Social Science Committee" and represents the cumulative result of three years' work. It contains thirty pages and includes a series of suggested lessons for high schools and industrial classes. This is issued to members free. The quality of the report may be judged from the personnel of the committee. Ruth Mary Weeks, whose study along this line is known the country over acted as chairman; Prof. John R. Commons of the University of Wisconsin, and Prof. Frank M. Leavitt, Assistant Superintendent of Schools, Pittsburgh, were the other two members of the committee. The results were tested out in various schools through cooperation of many individuals.

Other committees are at work for the coming meeting. Last year agricultural education was given a very prominent place on the program. Prof. F. W. Stewart, State Supervisor of Agricultural Education, Columbus, Ohio, is chairman of the committee this year, and the impetus given this subject last year will show excellent results at the coming meeting in Milwaukee.

C. M. Yoder who is chairman of the committee on Commercial Education, reports progress on some interesting investigations and study by his committee.

An exhaustive study on the problems of vocational education as related to "Women in Industry" is being prepared by a committee of which Miss Elizabeth Fish of the Vocational School of Minneapolis is Chairman.

At Minneapolis the sections devoted to Vocational Guidance were filled with interesting discussion. It was felt by everyone in attendance however that the position of the vocational guidance movement was materially strengthened, and due allowance made for its many valuable features in the face of previous attempts to discredit its results. With Harry D. Kitson, of the Department of Psychology at the University of Indiana, as Chairman of the committee, there is no question but that the committee with its report at Milwaukee will "meet all comers".

The Industrial Education Committee, under W. F. Faulkes, Supervisor of Trades and Industries of the State of Wisconsin may be expected to present a valuable contribution to this topic.

Miss Martha H. French of the Household Arts Department of the State Normal School, Ypsilanti, Mich., is chairman of the committee on Home Economics, which has for the past two years been at work on some particularly interesting problems connected with this line of education. The report may be looked for as a distinct contribution to the subject.

Then there is the Committee on Membership. Everyone in the middle west is a member of this committee. This means *you*. Sit down at once and write the Secretary, Leonard W. Wahlstrom, 1711 Estes Ave., Chicago, and give him the names of everyone you think should be a member of this live association. A dollar will pay for a membership, and in addition, will bring a copy of the valuable report of the Social Science committee mentioned above, as well as future issues of the monographs. Get busy, and make your plans to

"Meet Me in Milwaukee in Mid-Winter"

January 11, 12, 13, 14, 1921.

Trade Classes Organized. The industrial department of the Gary, Ind., schools has organized special trade classes to meet the needs of students who have returned to full-time schools after being in employment and in continuation school. Special adjustment of courses has been made for students above 14 years whose needs can be better served in trade classes.

The courses offered for boys comprise machine-shop practice, foundry and forge work, with mechanical drawing and the related subjects of shop arithmetic, industrial geography and business English. The courses for girls include home making, with special adjustment of courses preparing for telephone and office work.

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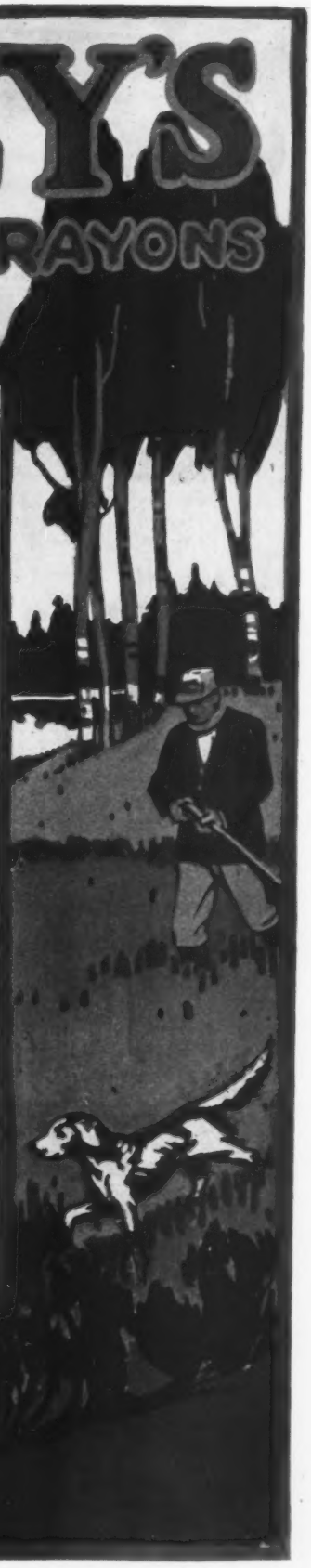

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NEWS AND NOTES.

Boys Make School Equipment. The manual arts classes at Claremore, Okla., have undertaken the making of T-squares for the domestic art department. They have also constructed and placed two ocean waves for the grade pupils. Wagons built according to directions published in past issues of the Industrial-Arts Magazine have also been undertaken. There are 52 boys giving 90 minutes each day to the work and 42 who devote 45 minutes twice a week to the work.

Lumber Contest. Last year a day was set apart as lumber day and manual arts classes at Claremore, Okla., were furnished material by a lumber dealer for the construction of a miniature bungalow. This year it is planned to hold a similar day on a much better plan. Lime, plaster, asbestos, cement and lumber representatives will give talks to the boys on several half days. Essays will be written and prizes will be awarded for the best essays.

Senior High School Work. The first semester in the senior high school at Madison, Ind., is given to elementary pattern making, while the second semester is devoted to home mechanics work. The boy is encouraged to bring furniture from home to be repaired, remodeled and refinished. New pieces of furniture are also made and such problems as repair of door locks, water faucets and installation of electric bells in the home are also undertaken. Last of all some attempt is made to combine wood and cement through the making of tile, blocks, posts, flower pots. In the junior high school the intensive plan is used for the purpose of better production. Mr. H. H. Stodghill acts as instructor in high school work.

Open New Center. Preparations have been made for the opening of an additional manual training center at Bloomington, Ill. Mr. John Heilman will have charge of the work.

Reopen Continuation School. The Continuation School has been reopened at Bloomington, Ill., on the voluntary basis. Attendance is limited mainly to those who desire to attend such a school. Both academic and vocational subjects are offered.

Work Offered at West Hammond, Ind. In the work being carried on at West Hammond, no attempt has been made to follow an iron-clad course. The aim is to get away from the omni-present idea and to treat each pupil as an individual. Each boy is allowed to make a choice of the first project. Then he is watched in the laying out of the project, the making of the drawing, the use of tools and his ability to do the work. Reasonable proficiency is followed by the selection of a second project.

The boys are encouraged to bring from their homes furniture of all kinds to be repaired by them in the shop, tools to be repaired or sharpened, and painting jobs such as staining, oiling, varnishing, plastering and cementing. One period a week is given to the study of tools, their parts, uses, care and history.

Each boy is paid a cent a minute in school currency for work accomplished. At the close of the day, he is given his pay envelope in which has been placed the day's wages. He cashes in every six weeks and receives the grade that the amount of his money calls for. Any overtime pay he is allowed to use as he sees fit. In some cases boys have earned enough overtime money to buy an extra half credit.

Equip Machine Shop. A modern machine shop has been installed in the new addition to the Alliance High School, at Alliance, O. The new addition makes possible a two-year course in machine shop practice and machine drawing. It is planned to work out a system through which boys may receive credit for two years' apprenticeship in the machinist trade. The industrial arts department is under the supervision of Mr. W. P. Pfouts.

Manual Training Course. Manual training has been added in the sixth grades at Independence, Mo. It has been included in the curricula of the seventh and eighth grades and the high school for several years. Cooking has been introduced in the high school under the direction of a special teacher.

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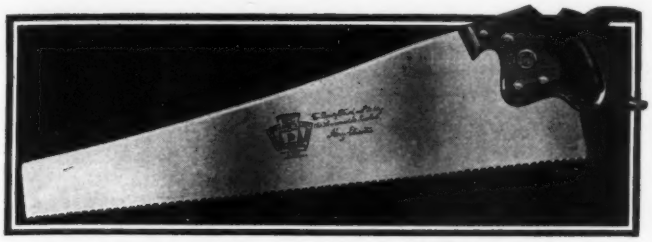

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CLEVELAND

(Continued from Page XXII.)

New School Occupied. The new senior high school at Clinton, Ia., which was occupied for the first time this fall, includes space on the ground floor for industrial and household arts departments. The household arts work includes courses in cooking, sewing, vocational home economics, freehand drawing and design. The industrial arts work consists only of woodwork and mechanical drawing. Plans have been made for the installation in the future of courses in printing, machine shop work, automobile mechanics and art metal work.

Evening Industrial Classes. The evening high school at Worcester, Mass., opened with classes in freehand, mechanical drawing, architectural drawing, manual training and wood turning.

Open Vocational School. The new vocational school at Madison, Wis., opened on the 6th of September, under the supervision of Director A. W. Siemers. The faculty is said to be the largest and best trained in the history of the institution and the curricula and equipment embrace every practical subject and apparatus in business training.

Tenth Annual Conferences for New York State. The tenth annual conferences on art and industrial arts for the season of 1921-22 have been announced by Mr. Leon L. Winslow, Head of the Department of Drawing and Industrial Training for New York State. The meetings are held for teachers and supervisors of art and industrial arts in elementary, secondary and teacher-training schools and are called once each year by the Division of Vocational and Extension Division at points distributed so as to effectively cover the state. Teachers are expected to attend the conference most conveniently reached from their schools or homes. The conferences and their dates are as follows:

Oct. 21. State College for Teachers, Albany.
Oct. 28. State Normal School, Fredonia.
Nov. 4. High School, Elmira Heights.
Nov. 18. State Normal School, Oneonta.
Nov. 21-23. Annual Convention of State Teachers' Association, Fine Arts Section, Buffalo.
Jan. 21. High School, Poughkeepsie.
Feb. 3. High School, Hudson Falls.
Feb. 10. Central High School, Syracuse.
Feb. 17. Free Academy, Utica.
Mar. 3. High School, Watertown.
Apr. 21. Hutchinson Central High School, Buffalo.
May 5. Rochester Normal School, Rochester.
May 29. Metropolitan Museum, New York City.

Open Part-Time School. The part-time school at North Tonawanda, N. Y., is offering three courses this year, including industrial, homemaking and commercial. In the industrial classes, boys are given shopwork, mechanical drafting, elementary science and academic work. The homemaking classes are instructed in academic and homemaking subjects while the commercial course prepares students for business, teaching, in addition to academic subjects, such lines as office practice and salesmanship.

The student body is about twice as large as last year, making it necessary that several special teachers be engaged for the year.

Metal Working Equipment Installed. The metal working shops at Manistee, Mich., have been equipped with lathes, milling machines, metal saws and vises. A part of the shop is equipped for mechanical and machine drawing. It is planned to install a gear cutting machine in the near future. Mr. Rudolph of Ripon, Wis., is in charge of the metal work classes.

Offers Art Courses. The Art Academy of Cincinnati is offering this year special courses in drawing, modeling, design, painting, composition and applied art for the benefit of art students. For the winter term, the tuition fees are $80 for day classes, $10 for night classes and $5 for registration.

(Continued on Page XXVI)

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(Continued from Page XXIV)

The Art Museum which adjoins the academy, has large collections of paintings, sculpture, textiles, pottery, metal work, and a consulting library rich in material for the study of art. Special exhibitions of modern art help to keep the student in touch with current developments as well as with the great art of the past.

The Academy points to the number of former pupils who have attained professional success as painters, sculptors, illustrators, designers and lithographers.

Textile High School. The textile school of New York City has been changed to one of high school grade and is recognized by the University of the State of New York as a technical school of high school grade. The change has been made because of the difficulty of getting high school or junior high school pupils to enroll in the absence of a diploma on graduation.

The textile school offers two courses: (a) a two-year course admitting pupils who have had two years of high school, and (b) a three-year course admitting pupils who have had one year in a high school or who have completed the ninth year in a junior high school.

Industrial Courses for Teachers. The School of Education of the University of Michigan, through the department of vocational education, is offering six different courses at the Cass Technical High School for the benefit of industrial teachers. Three of these are special methods courses, two deal with the part-time school, and one with its problems and another with teaching principles.

A course offered for the first time this year and open only to advanced students provides opportunity for a study of special problems in vocational education.

The courses are offered for the benefit of teachers who wish to meet the state requirements for vocational and part-time instructors, and for men and women who wish to qualify as teachers of shop subjects in vocational and part-time schools.

Day Classes for Building Trade Workers. The Department of Vocational Education of the Cincinnati schools has established a building trades school under the direction of Chelsea L. Bailey. The school is intended to be of special benefit to men temporarily out of work who desire to improve their time during the slack season. Classes are held one morning each week from 7:30 to 11:30, and tuition and material are furnished free.

To Erect Continuation School. Supt. Henry Snyder of Jersey City, N. J., has urged the board to immediate action in the matter of the proposed building for the continuation school. For the present, the school will use the buildings and facilities of the day schools at such times as they are not used by regular classes.

Bonus for Continuation Teacher. Supt. Henry Snyder of Jersey City, N. J., has asked for a bonus of $120 a year for continuation teachers as against $60 given last year. The bonus is urged in recognition of the tedious character of the work and the need for sturdy teachers.

New Manual Training Shops. Two new manual training shops have been established in the schools of Washington, D. C., this year.

Vocational School Has Overflow. The Boys' Vocational School at Newark, N. J., recently turned away 150 boys who applied for enrollment. The grade of work being done at the school has been a great impetus to enrollment and a better type of applicant is constantly being admitted.

Teacher-Training Courses. To meet the increasing demand for teachers in the vocational schools, the New York State Education Department in cooperation with the Albany school department, has opened evening classes to qualify teachers for the special certificate issued for teaching in these schools. The courses are open to men between 23 and 38 years with at least five years of experience of journeymen grade. The trades represented are bricklaying, painting and decorating, electrical construction, printing, machine shop practice, carpentry, cabinet

(Continued on Page XXIX)

(Continued from Page XXVI)

making, automobile mechanics, sheet metal work, architectural drafting, machine drafting and industrial chemistry.

Hold Fall Exhibit. The Vocational Society for Shut-Ins, at Chicago, from October 1 to 8 held an exhibit of the work of disabled persons including fine arts, needlecraft, decoration and weaving. Mrs. F. M. Peebles, Jr., who acts as president of the society, points out that the work has brought scores of persons to a self-supporting basis and has at the same time produced a healthier frame of mind and an active use of long atrophied muscles.

Widen Scope of Part-Time Schools. City and state school heads have cooperated in enlarging the scope of the work offered in vocational part-time schools at Atlanta, Ga. The work for men is carried on at the Atlanta Technical High School and that for women at the Commercial High. The first work along these lines will be an intensive course in salesmanship.

At the Technical High, instruction is offered in automobile mechanics, machine shop practice, acetylene welding, architectural drawing, sheet metal work, woodwork, forging, and mechanical drawing.

New Courses at Minneapolis. The Vocational School of Minneapolis is offering courses in automobile mechanics, mechanical drafting, electricity, blueprint reading, telegraphy, retail selling, salesmanship, banking, commercial work and steam engineering for the benefit of men students.

Add Stone Work. The board of education at Bedford, Ind., in cooperation with the Bedford Stone Club, is offering a course in vocational stone work in the high school. Stone working machinery has been installed for the purpose.

Veterans' Work Exhibited. The work of wounded veterans of the world war was recently exhibited at St. Paul in connection with the State Fair. The exhibit which was in charge of R. R. Rosell, covered many activities ranging from the fine arts to machine shop work and agriculture.

Courses in Cotton Manufacturing. The New York Textile School is offering a course in general cotton manufacture, including a study of cotton fibre, preparatory processes, weaving, dyeing, bleaching, and yarn finishing. Some time will be given to a study of the various samples from the trade, and to an actual analysis of fabrics to determine the construction, weight, yarns, used, etc.

Large Enrollment in Manual Arts. Almost 90 per cent of the boys in the high school at Alpena, Mich., are enrolled in the manual arts course. Mr. Lee O. Day has been hired as an assistant in the work.

Revise Course of Study. In revising the course of study in grade drawing at Cowesett, R. I., the design element has been used as the basis, with the utilitarian idea emphasized as far as possible.

In the high school chair caning, electrical problems, costumers, waste baskets and useful articles are the choice of most of the boys. The courses are effective and the work is conducted on a different basis. Mr. W. A. Grinnell is director of the work.

Introduce Cooperative Class. A cooperative class in retail salesmanship has been introduced at Altoona, Pa., in connection with the vocational work. Classes are drawn from sixteen retail department stores, comprising four special lines, such as shoes, textiles, millinery and men's furnishings, and three general merchandising groups.

In the regular day school courses in trade theory and vocational guidance are provided which are considered worth while and somewhat unique in character. No texts are used but notes are taken and an attempt is made to interpret trade theory in a new way. Mr. C. E. Hedden is director of vocational education for the Altoona schools.

Continue Course in Occupations. The success of a study of "occupations" in fifth and sixth grade classes at Natick, Mass., last year has resulted in an extension of the subject for this year.

The introduction of the first Starrett Tool more than forty years ago brought to the metal working trades a new standard of accuracy in precision tools. Today the Starrett tradition of dependable accuracy is upheld by 2100 Starrett Tools.

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The freshman class in manual training, beginning this year, are given their choice of seven subjects, namely, cabinet making, concrete construction, printing, brush making, electricity, metal work, painting and finishing. Cabinet making, electricity and metal work were selected as the three subjects for the year. Thirteen weeks will be devoted to each subject. Mr. R. L. Harrington is director of manual training activities.

Manual Arts at Winfield, Kans. The manual training department of the Junior-Senior High School, at Winfield, Kans., has an enrollment of 358 boys, each taking one period of work daily. Four teachers are employed under the direct supervision of Mr. L. H. Alberty, director of manual arts work.

The courses for this department while planned to teach the principles of the work, the use and care of tools and machinery, study of materials, etc., are of a practical nature offering actual shop and millwork experience. In this department, two years of work in elementary cabinet making and elementary mechanical drawing are offered. Smaller articles of furniture including foot stools, pedestals, book racks and porch swings are taken as problems. In the second year, medicine cabinets, book racks, small tables, flower boxes and tea wagons are constructed.

In the Senior High School, boys are offered work in elementary furniture making, mechanical drawing, advanced furniture making and furniture design. In the advanced class, the larger pieces of furniture are constructed. A total of 32 phonograph cabinets has been constructed in the last three years.

The woodwork courses consist of six months of shopwork and three months of drawing and lecture work. Manual training is required of all boys in the seventh and eighth grades of the Junior High.

Boys from the country are offered farm mechanics, consisting of courses in farm carpentry, blacksmithing, gasoline engine work, harness repair and cement work. In each of the courses, practical training is given in the erection of garages, barns and chicken houses for the farm and its environs. At present, ten barns are being erected for the Cowley Live Stock Show at the Fair Grounds. Blacksmithing is a course intended to serve the farm community. In all these courses, considerable leeway is given the student in the selection of projects, limiting him only to projects involving the principles taught.

There are 2,207 tools and 213 machines, together with benches, cases and larger pieces of equipment which are furnished the department. All machines are individual, electric power, and equipped with safety devices and belt guards. The value of the machinery in the possession of the department is estimated at $12,000.

Manual Arts Work Extended. The manual arts work in the La Salle-Peru Township High School, at La Salle, Ill., has been extended by the addition of a one-year advanced course in machine drafting, and a similar one in automobile mechanics. These courses take up both the theoretical and the practical sides of the modern automobile.

The department of household arts has been enlarged by the addition of classes in cooking and the employment of two teachers.

Furniture Blueprints. A practical feature of the work in manual training and mechanical drawing at Onaway, Mich., is the making of blueprints for various pieces of furniture. It is found that the work of drawing, tracing and making the prints eliminates the troubles in the reading and interpreting of drawings. Mr. Douglas Steere is instructor in vocational training in the high school.

Automobile Repair. The manual arts department at East Waterloo, Ia., has recently installed a department for automobile repair. Mr. J. A. Hoskins is instructor in this work.

Products of Printing Shop. The estimated value of printing products turned out by the department at East Waterloo, Ia., up to last June was $1,560. The work in-

(Continued on Page XXXIII)

(Continued from Page XXX.)

cluded all school printing jobs such as report cards, directories, stationery, tickets and posters.

Mechanical Drawing Department Enlarged. The mechanical drawing department at Athens, Ga., has been enlarged by new equipment and new quarters. The enrollment has increased more than one hundred per cent as a result of special attention given to the work.

The wood working department which is housed in a separate building, has also experienced an increase in enrollment. During the past year the boys made a number of canvas canoes which were put into successful use during the summer. They were constructed of barrel hoops, covered with heavy canvas, and painted with ordinary house paint.

New Quarters for Manual Arts. A new high school which is under construction at Jeannette, Pa., will house the continuation school, mechanical drawing and cabinet work. Cooking and sewing are offered to girls who attend either the high or continuation school. The building is expected to be occupied by September, 1922. Mr. O. K. Snyder acts as principal of the continuation school.

New Painting Building. A new building has recently been erected on the grounds of the Peckham Vocational School, at Buffalo, N. Y., by the pupils of the wood working department, to take care of classes in painting and wood finishing. The general arrangement of floor space, stock room and equipment has met all requirements essential to a school shop.

The type of work offered at the Peckham School consists of practical trade subjects as found in the industries. The output of the shops furnishes a splendid variety of projects for practice work in standard and special wood finishes. An interesting subject in connection with the shopwork is trade science, which covers the mixing and preparing of paints, stains and varnishes used in painting and finishing problems. Mr. Louis Kievet is instructor of painting and wood finishing at the Peckham School.

Give Pupils Part-Time Jobs. A campaign has been begun at St. Paul, Minn., to provide part-time employment to pupils who wish to earn money to pay part of their school expenses. All cases are investigated individually and an effort is made to place pupils in employment in which they may earn enough to begin high school. An average of twenty boys and girls has been placed by the bureau each week, while the average number of applications has reached one hundred.

New Vocational School. A new vocational school is to be built at St. Paul during the coming year. The first unit which it is planned to have completed by the opening of school next year, will be 125 feet by 80 feet and four stories in height. The building will contain shops for carpentry, machine shop practice, sheet metal work, millwork, pattern making and cabinet making, rooms for architectural, freehand and engineering drawing, classrooms, garage, principal's office, library and auditorium. Soldier students of the government school are at present at work on the construction of $5,000 worth of furniture and equipment for the shops and classrooms of the new school.

Jewelry Making for Soldier Students. Classes in jewelry making, watch repairing and stone setting for disabled soldiers were established in St. Paul, on November first. About 65 student soldiers will be accommodated, funds for the work having been provided by the Federal Board. The work is in charge of Mr. G. M. Brace, director of vocational training.

Practical Arts Work Extended. The scope of the practical arts work in the schools of West Springfield, Mass., has been enlarged to include mechanical drawing and shopwork through four years of the high school, with sessions five days a week and periods of eighty minutes each day. In the Junior High School, the work is offered three days a week, with periods of seventy minutes per day.

The department reports the erection and equipment of a shop for the Junior High School and for grade work.

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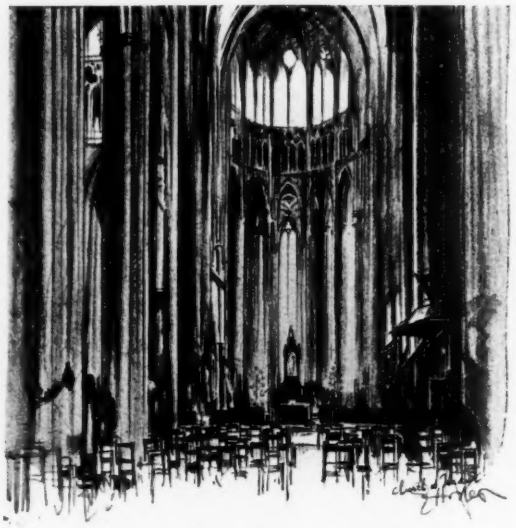

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Mr. Harold Vinicombe is the new assistant. Mr. M. J. O'Malley is supervisor of the work, with the assistance of Mr. F. T. Dacey and Mr. Harold Vinicombe.

Practical Electrical Course. A course in practical electricity is being offered for the first time in the Senior High School, at Wichita, Kans., with Mr. J. C. Woodin as instructor.

Foremanship Conferences. More than 75 foremen have signed up for courses in foremanship training under the auspices of the board of education of Wichita, Kans., the Board of Commerce and the Manufacturers' Club. The courses will be under the direction of Mr. A. A. Knapp, employment manager of the Coleman Lamp Company, and Mr. O. B. Badger, director of industrial education for the Wichita public schools.

Practical School Work. The Boys' Vocational School, at Albany, N. Y., has turned out work to be used in the city schools to the value of more than $4,000. This was over and above the cost for all materials.

Evening Industrial Courses. The evening schools of Albany, N. Y., are offering courses in mechanical and machine drawing, architectural drawing, cabinet making, electrical theory, automobile mechanics, drawing for trade workers, wood carving, printing and machine shop practice for men. For women, there are courses in cooking, dressmaking and millinery.

Practical Home Making. The board of education at Grand Rapids, Mich., has purchased two residences to be used by the grade classes in home making. The houses are to be equipped for the use of the girls by the boys' classes as a part of the shopwork, thus offering practical problems so difficult to find for regular work. Mr. L. R. Abbott acts as director of manual training and industrial education.

Birdhouse Contest. A birdhouse contest for the boys of the sixth, seventh and eighth grades was held at Portage, Wis., under the direction of Mr. R. M. Naset, instructor in manual arts. The houses were made of old box material or waste material which the boys brought to school. Four prizes were awarded on the basis of practicability in use, neatness in workmanship and finish. It is planned to hold a similar contest next spring.

Add Printing Course. The high school at Emporia, Kans., has added printing to the manual training work. A large class has been enrolled with Mr. F. Jay Smith as teacher. Mr. F. G. Bashaw acts as supervisor of the manual training department.

Lectures on Art Subjects. The Metropolitan Museum of Art, New York City, during the season from November to and including March, 1922, is offering a course of Sunday lectures on art, design, color, and architecture. Among the interesting topics are "Some Sources of Design," "Modern Domestic Architecture in the United States," "The Sky-Line of New York," "Furniture and Furbelows of the XVIII Century," "Porcelain," "Book Design," and "Color." The lectures will be delivered by well known critics and authors such as Walter Sargent, Richard F. Bach, Grace Cornell, Charles F. Binns, Lorado Taft, H. L. Koopman, and William M. Ivins, Jr.

Undertake School Problem. The superintendent of schools at Hudson, N. Y., had made a request of the carpentry shop for three blackboards on standards. The advanced and elementary classes, working in conjunction made the blackboards in a short time. They proved a very practical problem for teaching the elementary processes for the reason that the standards involve squaring, sawing and planing.

At present the boys are making a number of small articles, including toys, flower boxes, candle-sticks, sconces, card files, and calendar holders. Mr. Kenneth R. LaVoy acts as director of industrial arts in the Hudson High School.

Progress of Work at North Platte, Neb. The manual training department at North Platte was organized four years ago and during the past few years has turned out some creditable work both in mechanical drawing and

(Continued from Page XXXVII)

"ENAMALEC" THE UNIVERSAL DECORATOR

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Children love to make **Useful** things **Beautiful.** Wooden and tin boxes when decorated with "Enamelac" and lined with cloth make beautiful jewel boxes, sewing boxes, etc. Old olive bottles, or any glass jar of good shape, becomes an atractive flower vase when decorated with "Enamelac." We supply a nest of five round wooden boxes for decorating at $1.50 per nest.

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"Ivorene" is the newest material for work in Decorative Design. It looks like ivory, but comes in sheet form. It can be cut with a sharp knife or a coping saw. It takes "Enamelac" decoration and makes Pendants, paper cutters, book marks, tags, and many other practical articles. Per sheet 4"x5", **30 cents;** 5"x10", **75 cents.** Also cut larger sizes.

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Decorate "Permodello" Jewelry

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This is a new Composition Board for making Toys, Table Mats, Boxes, Waste Baskets and other Novelties. Takes decoration with "Enamelac." Ready cut circles for Table Mats. This new and inexpensive Board will solve many of your hand-work and construction problems. Send for sizes, prices and samples.

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"Stencillex" Cloth for Stenciling
"Crasheen," a gray Art Crash
"Modelit," the ideal Wax Clay
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Prang Colored Crayons
Mounting Books, for decorating
Paper Portfolios, for decorating
"Long-Leaf Pine Needles" for Basketry
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(Concluded from Page XXXVII)

woodwork. A number of the students have received credit for their work at the higher institutions, notably Armour Institute and the University of Nebraska.

The department has installed five machines and is planning the further installation of a 36-inch band saw. The aim of the department is to install one new machine each year until the shop is fully equipped for all work. There are at present seventeen benches in constant use.

The classes in woodwork include boys from the seventh to the twelfth grades and each boy is required to take two years of handwork before proceeding to run a machine. The first semester is devoted to work throughout the schools, including repairing and the building of necessary articles needed in the classrooms. Last year the classes removed a tile wall separating the drawing room from the wood shop, making one large shop. The work was done by the boys at a very low cost, leaving only the plastering to be done by the contractor who finished the work. The second semester is given to the construction of furniture, each boy making what he needs. Beginners take a course of exercise along the line of preparatory work. All work done for the schools is charged to the board and each boy is charged for material used in making furniture for his own use. The department is on a self-supporting basis which is considered a feature worth while. Mr. H. H. Newman who acts as instructor in manual training, has been a teacher for the past twenty years.

PERSONAL NEWS NOTES.

Mr. Ferd. Masters of Maryville, Mo., has been engaged as instructor of sixth-grade manual training at Independence.

Mr. Percy Angove, formerly of Ionia, Mich., has been appointed State Supervisor of Vocational Rehabilitation for the Michigan Department of Public Instruction. Mr. Angove entered upon his new work on October first.

Mr. Walter Stanley of Beloit, O., has been employed to teach manual training in the ward buildings at Alliance, O.

Mr. D. S. Ullrick of Evanston, Ill., has become assistant director of arts in the Bloomington High School, at Bloomington, Ill. Mr. Ullrick succeeds G. J. Skinner.

Miss Ada Rockhart of Natick, Mass., has been appointed head of the evening practical arts department at New Bedford, Mass.

Mr. J. T. Mendenhall has been employed as a teacher in the Holyoke (Mass.) Vocational School.

Mr. Henry Johnson of Somerville, Mass., has been appointed instructor in manual training in the grades at Haverhill.

Mr. Walter A. Pierce of Claremont, N. H., has been appointed Supervisor of Trades and Industries for the New Hampshire State Board. Mr. Pierce will make his headquarters at Concord.

Mr. Lewis H. Carris has been appointed Director of the Federal Board of Education at Washington, D. C. Mr. Carris was formerly in charge of the Division of Industrial Rehabilitation and previously acted as assistant commissioner of education for New Jersey.

Mr. S. Anthony Van Kammen, formerly supervisor of manual training and art at Greenville, Mich., has accepted the position of Director of Manual Training at Peoria, Ill.

Mr. Howard C. Nelson of Bloomington, Ill., has been employed to teach part of the wood working classes, at the La Salle-Peru Township High School, La Salle, Ill.

Mr. Albert Klyver has been appointed assistant instructor in wood working at Natick, Mass.

Mr. G. A. Ledle who taught at Eureka, Kans., last year, has been employed to teach benchwork and cabinet making at Emporia.

Mr. J. E. Lockwood of Wichita, Kans., has been appointed Supervisor of Manual Arts, at Parsons.

Mr. R. R. Sellars has been employed to teach drawing at the Senior High School, Wichita, Kans., succeeding J. E. Lockwood.

(Concluded on Page XXXIX)

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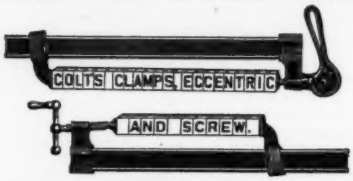

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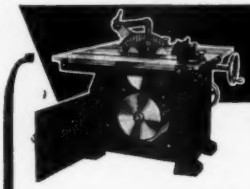

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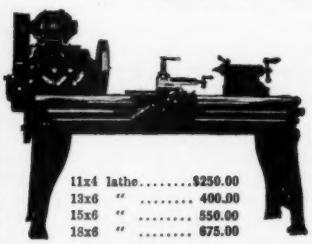

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(Concluded from Page XXXVII)

Mr. Lloyd E. Peterson, who has had charge of the industrial-arts work at Nebraska City, Neb., has been made principal of the high school of the same city. Mr. Peterson is succeeded in the former position by Mr. Adam Traudt of Lincoln. Mr. Traudt is a graduate of the Peru Normal School, having completed the industrial-arts course at that institution.

Mr. Wm. V. Winslow has been made director of the Part-Time School at North Tonawanda, N. Y. This year the 14, 15, and 16-year-old children are required to attend. The school has an enrollment of 132 students with a teaching corps of eight instructors. The courses include home making, industrial and commercial subjects. Classes are held at the high school building each Saturday morning, with sessions from eight to twelve o'clock.

Mr. Holden B. Mansfield has been engaged to teach wood working at the high school, North Tonawanda, N. Y.

Mr. Harry Stevenson has recently become instructor of manual arts at the South Kitsap Union High School, Port Orchard, Wash. Mr. Stevenson was formerly marine engine boiler draftsman for the Puget Sound navy-yard.

Mr. Raymond C. Keople, formerly director of manual training of the Rochester (N. Y.) public schools, has recently been appointed employment-certificating officer under the compulsory education law of the state. Mr. Keople will work in conjunction with Assistant Superintendent Joseph O'Hern, who for many years has had charge of the general administration of the compulsory education law.

Mr. Keople has been connected in various capacities with the Rochester schools since 1912, coming from Mattoon, Ill., where he had taught manual training in conjunction with a number of academic subjects. He was graduated from the University of Rochester in 1905 with the degree of Bachelor of Arts. From 1906 to 1909 he was employed by the Western Electric Company.

In 1912 Mr. Keople returned to the University of Rochester and received the degree of Master of Arts. He was put on the teaching staff of the Rochester Shop School, and in 1914 was appointed assistant director of vocational education. In 1919, after taking extension work in industrial education, junior high school administration and psychology at the University, he was appointed supervisor of manual training. In 1918 he was appointed director of manual training in the schools, and a year later was placed in charge of night school and summer school classes.

TRADE PUBLICATIONS

Issue Booklet. A unique booklet, entitled, "Block Printing in the Schools," has been published by the Sigmund Ullman Company, New York, manufacturers of printing inks. The feature of the booklet is the illustrations, four in number, printed direct from linoleum blocks. So far as can be ascertained, the booklet is the first commercial printed product containing illustrations printed direct from linoleum blocks.

The blocks, which are printed in five colors, were designed, cut and printed by public school teachers. The printing was done in a school print shop. The edition being necessarily limited, it would be well for those desiring a free copy to write for them immediately. Requests should be mailed on school stationery to the Linoleum Block Printing Supply Company, 263 Whiton Street, Jersey City, N. J.

How to Build Phonographs. The Federal Supply Co., 410 W. 28th St., Indianapolis, Ind., has just issued a new four-page circular, describing in detail, the designing and the construction of phonograph cabinets. The pamphlet is the work of Mr. D. K. Mereen, of the Oregon Agricultural College and outlines in detail, the machinery and detail operations for each part of a typical phonograph cabinet.

The pamphlet is an excellent example of job analysis and will be found helpful in every school shop. It is available gratis.

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